Farm Chemicals

Pioneer Journal of the Industry

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Here's proof of the MICHIGAN'S bonus margin of weight distribution. These are the heaviest, most powerful tractor shovels on the market today. Even with a 100% bonus bucket load, you still have complete stability and traction.

One brief demonstration will convince you quickly that you'll get a Bonus Bucket every time with a MICHIGAN Tractor Shovel—for more yardage moved, in fastest time, at lowest cost. Such a test is easy to arrange—simply call your nearby MICHIGAN distributor; or use the coupon. MICHIGAN Tractor Shovels are available under the Clark leasing Plan—we'll be glad to send you details.

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Farm Chemicals

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Cover Story

Swift's Golden Vigoro Complete Lawn Food is termed a new concept in fertilizer formulation and results from the idea that a plant food can be made practically "burnproof" by controlling the rate at which nutrients dissolve in water. Packaged in 50 lb. bags selling at about $3.50, it will be backed by Swift's biggest plant food promotion campaign.

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In this issue . . .

Sales were up in '54, but there were still lots of complaints in the pesticide industry. The problems and some suggestions on possible cures are aired in a report that begins on page 26.

Rapid tax depreciation may mean a lot to your company this year. On page 31, a New York corporate expert discusses the subject, reviewing various methods, advantages and related information.

A number of new products were introduced to the industry during 1954, and new uses were found for some of our most popular pesticide materials. For a review, turn to page 38.

Maleic hydrazide has already shown a great deal of promise in a variety of applications. Douglas Tate, Nautatuck Chemicals, discusses this interesting material on page 47, pointing out major areas of usage.

Two new departments make their appearance with this first issue of 1955. Dr. Melvin Nord, whose columns will be familiar to many readers, begins a regular Patent Review column, found in this issue on page 55. A Book Department is the second added feature. It's designed to make it easier for you to obtain new books as well as more standard works. While on the subject of new departures, how do you like the new FC cover?

Reports on meetings in this issue include some pictures taken at the Chicago MWSIC meet on page 37 and coverage of the California Fertilizer Association gathering on page 46.

It looks like there will soon be some big developments in the Mexican fertilizer industry. A Mexico City correspondent provides a brief report on the subject on page 46.

Pesticide safety has come up for review in Oregon, and that state has initiated a safety campaign designed to foster safe application and handling. See page 29 for a statement by J. D. Patterson, Oregon's chief chemist.

His challenge: Keep 15 plates filled!

AND to do it, your friend, the American farmer, has a real fight on his hands: Against weeds—they starved out $5 billion worth of crops last year. And against insects—they took a $4 billion bite.

By 1980, there will be nearly 200 million Americans—more people than the land can feed at present production rates. Only better farming methods—and especially better weed and insect killers—can fill the hungry gap.

America's chemical industry is already performing miracles for the farmer. A revolutionary insecticide, introduced to U.S. agriculture by Pittsburgh Coke & Chemical, makes the entire plant self-protecting against many insects. New herbicides kill weeds before they sprout but are completely harmless to the crops they protect.

Today, Pittsburgh's Agricultural Chemicals Division serves American agriculture with a wide range of important, basically-produced *"Pittsburgh"* farm chemicals. And to provide the farmer with his food-saving weapons of tomorrow, our laboratories are conducting intensive, continuing research.

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COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

W&D 5191

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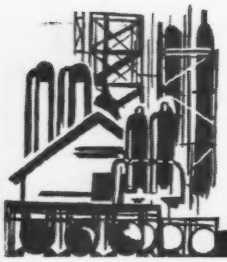


INDUSTRY NEWS

USDA Pesticide Certification Rules

USDA HAS proposed regulations to be followed in obtaining USDA certification of usefulness of pesticide chemicals as now authorized by the 1954 amendment to the Federal Food, Drug and Cosmetic Act.

Under this amendment to the act (Public Law 518) residue tolerances or exemptions may be established for pesticide chemicals likely to occur as residues on harvested food crops, so that human consumption of toxic amounts of these chemicals can be avoided.

The amendment requires that a tolerance be established by:

1. Filing a petition proposing the tolerance, together with supporting scientific data to establish safe residue levels, with the Secretary of Health, Education and Welfare (Administrator of Food, Drug and Cosmetic Act).

2. Filing with the Secretary of Agriculture a copy of the petition and a request to certify to the Secretary, HEW, that the pesticide chemical is useful for its intended purpose and that the requested tolerance reasonably reflects the amount of residue, if any, likely to result when the pesticide is used as proposed.

The complete proposals for certification procedure, published in the Nov. 24 Federal Register, include these points:

a. Requests for certification (see 2, above) should be made in writing to the chief, Plant Pest Control Branch, Agricultural Research Service, USDA, Washington 25, D. C. Certification should be asked for, only on economic poisons that have been registered or submitted to USDA for registration as pesticides under the Federal Insecticide, Fungicide and Rodenticide Act. These requests must be accompanied by a copy of the petition for tolerance that has been submitted to the Secretary, HEW, (See 1, above).

b. Requests for certification should be supported by reports of all experimental work demonstrating the effectiveness and usefulness of the pesticide. These data, plus any other available information about the pesticide, serve as a basis for USDA's certification decision.

c. If for any reason certification is not justified in all respects, the applicant will be so informed by registered mail. Within a week after receipt of notification, the applicant can file a request with the chief, Plant Pest Control Branch, for (1) certification to the extent proposed by USDA; (2) a hearing on the proposed certification or the parts objected to; (3) both such certification and a hearing or (4) withdrawal of the request for certification.

Stauffer Expands West Coast Fertilizer Plants

Stauffer Chemical co. plans to expand its fertilizer manufacturing facilities at Vernon and Richmond, Calif., according to a recent announcement. First step in the million dollar expansion program will be at Vernon, where a new plant will be built with capacity of about 500 tons per day of pelletized superphosphate and other modern ammonium phosphate fertilizers.

The first of its kind, the new facility will employ a process developed and designed by Stauffer. Completion and initial production of the addition, to be located adjacent to the company's large fertilizer plant at Vernon, are planned for mid-1955.

Wilson & Geo. Meyer & co. will act as exclusive sales agents for the new products.

Plans for U. S. Steel N Plant Near Completion

Blaw-Knox co. recently announced that it is nearing completion on the engineering design of a 200 ton per day ammonia plant to be built by United States Steel corp. at its Geneva, Utah, plant. Construction on the plant, to be the largest of its type in the nation, is scheduled to begin early this year.

US Steel will produce anhydrous ammonia and ammonium nitrate for agricultural and industrial markets in the Intermountain and Pacific Northwest areas. Coke oven gas produced at the Geneva plant will be used as the source of hydrogen in the ammonia unit.

Potash Dumping Cited By Treasury Department

The U. S. Treasury dept. on Dec. 14 forwarded the Tariff Commission a dumping case involving imports of muriate of potash into the U S from West Germany and from France. Another case had been sent to the Commission in November involving East German potash.

The Treasury has stated that the potash is being sold in this country at less than fair value, and under the Customs Simplification Act of 1954, the commission will determine whether or not there is injury or likelihood of injury to U S industry. If the findings of the commission are affirmative, the Secretary of the Treasury then is directed by law to impose penalties on imports sufficient to do away with price advantages of the imported products.

Public hearings on the East German material will be held on Jan. 18, at the Tariff Commission's Washington headquarters.

A joint convention will be held by the National Fertilizer Association and the American Plant Food Council at the Greenbrier hotel in White Sulphur Springs, W. Va. on June 13-15.

Pennsalt Acquires I. P. Thomas & Son Assets

Stockholders of I. P. Thomas & Son co. have approved a plan under which Pennsylvania Salt Manufacturing co. will acquire Thomas assets in exchange for 18,851 shares of Pennsalt common stock.

This announcement was made by J. S. Coale, board chairman of the Thomas co., who stated that his company will become an operating division of Pennsalt Chemicals on or before March 31, 1955.

"Under the continuing direction of R. R. Hull, for eight years president of the Thomas co., we are looking forward to serving larger markets with Thomas' well-known line of mixed fertilizers and superphosphates," Pennsalt president George B. Beitzel stated.

New Phillips Agr. Project

The Phillips Agricultural Demonstration Project, located four miles north of Foraker, Osage county, Okla., was recently established by Phillips Petroleum co.

Designed to study the feasibility of using nitrogen and phosphate fertilizer materials on native and introduced grasses and legumes, the economics of revegating areas previously cultivated and range land conservation and management, the project will provide a practical demonstration area where farmers and ranchers, technical specialists and others with agricultural interests can observe various projects underway.

Other projects planned involve use of various farm chemicals and petroleum products in grassland farming,

Hercules Fetes 4-H Winners

A buffet supper honoring National and Section winners in the National 4-H Entomology Awards Program was given by Hercules Powder co. on Nov. 29.

National contest winners received $300 college scholarships and sectional winners were awarded trips to the National 4-H Club Congress in Chicago.

Brea Market Unit Formed

Establishment of the Amm-o-gro div. of Specialty Oil Products as marketer of anhydrous ammonia produced by Brea Chemicals, Inc., subsidiary of Union Oil co. of Calif. has been jointly announced by H. R. Fifer, Brea vice president in charge of marketing and distribution, and Robert E. Maloney, Specialty Oil Products.

Kenneth Purchase will head the new Amm-o-gro div. with headquarters at 114 Sansome St., San Francisco. A district office will soon be established in Fresno, Calif.

Girdler G-29 Catalyst

The Girdler co. has reported that in recent commercial tests its G-29 catalyst has demonstrated significant economic advantages over similar nickel base catalysts.

A company spokesman stated that in preparing ammonia synthesis gas by the steam-reforming process a 25 per cent increase in production capacity could be obtained without sacrificing quality of synthesis gas.

"At the production rates used with previously available catalysts it is possible to reduce the reaction temperature by 100° F. without loss of efficiency, thus saving process fuel costs."

Tailings

We're not only out-numbered; we're also out-weighed. Maine Farm Research indicates that the total weight of insects may be greater than that of all land animals.

♦ ♦ ♦ ♦

In answer to numerous request on how to obtain USDA's Agricultural Handbook No. 86 (Fertilizer Use and Crop Yields): send 50 cents to the Supt. of Documents, U S Govt. Printing Office, Washington 25. This compilation of the findings of the National Soil & Fertilizer Research committee headed by W. H. Garman, now APFC agronomist, is invaluable to all fertilizer producers, citing opportunities for more efficient fertilizer use in all regions.

♦ ♦ ♦ ♦

Better get ready for the 1954 Census of Manufacturers. We've seen the reports that will be filled out by fertilizer and pesticide manufacturers and they seem to add up to a lot of over-time.

♦ ♦ ♦ ♦

J. J. Davis of Purdue says that about 70 per cent of insecticides sold in retail stores are wasted, mainly because of failure of users to read directions. Also commenting on mis-use, New Mexico A & M's R. C. Dobson emphasizes the importance of use only under favorable conditions. A vast majority of complaints are due to application in high winds, says Dobson. If you've been getting complaints from growers, it may pay to have your salesmen emphasize more strenuously the need for careful application under favorable conditions.

♦ ♦ ♦ ♦

USDA entomologists estimate that over $3 million of livestock forage was saved in grasshopper control programs on some 788,000 acres of Western rangeland. Mormon cricket control activities reduced damage from that pest by $486,000. Value of control is set at $9 and $6 return respectively for each dollar spent.

♦ ♦ ♦ ♦

Grass killers may be the answer in establishing birdsfoot trefoil, says Iowa State College. TCA at 4 lbs. actual prior to emergence has given excellent results.

♦ ♦ ♦ ♦

Virginia-Carolina Chem. has a different approach to plant safety—a contest for employees' children under 14, completing in 25 words or less, "My Dad (or Mom) should work safely in his (or her) job because . . ."

Coleman Addresses AAI

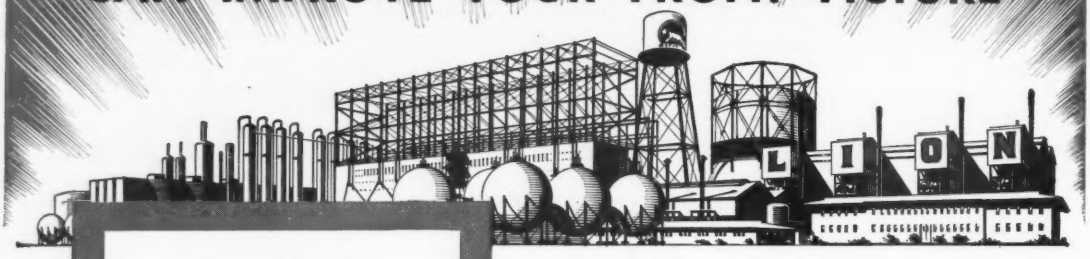
"Fertilizer—An Answer to Our Farm Surplus Problem" was the subject of Dr. Russell Coleman, president of the National Fertilizer Association, when he addressed the Agricultural Ammonia Institute on Dec. 7 in New Orleans.

Proper fertilizer usage can help solve the short-term problem of farm surpluses as well as the long-term problem of feeding our increasing population, stated the NFA head. The short-term problem facing American agriculture is not so much how to adjust production to demand, but how to do it without reducing net farm income. The answer, he said, is to decrease unit costs of producing farm commodities through proper fertilizer use and other good farming practices, thus making it possible for farmers to make as much or more profit from smaller acreages and smaller total output.

FOA Order to Yugoslavia

An authorization has been issued by the Foreign Operations Administration to Yugoslavia for purchase of $1 million of nitrogenous fertilizers in the U S and possessions, Latin America and European cooperating countries. Dec. 31, 1954, ended the contract period and the delivery date extends until Feb. 28, 1955.

Buying from A LEADER CAN IMPROVE YOUR PROFIT PICTURE



Lion—A Leader in Petro-Chemicals—offers

ONE-STOP SERVICE FOR QUALITY NITROGEN FERTILIZER MATERIALS

Lion Anhydrous Ammonia — For formulation. A uniformly high-quality basic product. Nitrogen content, 82.2%.

Lion Aqua Ammonia—For formulation or acid oxidation. Ammonia content about 30%. Other grades to suit you.

Lion Ammonium Nitrate Fertilizer —For formulation or direct application. Improved spherical pellets. Guaranteed 33.5% nitrogen.

Lion Nitrogen Fertilizer Solutions —For formulation. Three types to suit varying weather and manufacturing conditions.

Lion Sulphate of Ammonia — For formulation or direct application. Uniform, free-flowing crystals. Guaranteed to contain a minimum of 21% nitrogen.

Because of Lion's leadership in nitrogen fertilizer production in the South, Lion can show you the way to MORE PROFITS.

When you buy your complete nitrogen requirements from Lion, you automatically put yourself in a position to improve your profit picture. Here's how:

1. **You Save Time** • You can contract at one time, with a single dependable source, for all of your nitrogen fertilizer material requirements. And, of course, time saved today is reflected in your profits tomorrow.

2. **You Prevent Manufacturing Delays** • Formulation material that does not have consistent quality can slow down or delay your own production needlessly. With Lion's Quality Control, you can be sure of *quality* materials. The difference will show up in your profit column.

3. **You Solve Problems Quicker** • If you run into a formulation snag, Lion's highly trained Technical Staff will be ready to give you the kind of technical assistance that can only come from a leader. This aid can help improve your profit picture... and *it's yours for the asking.*

DISTRICT SALES OFFICES: NATIONAL BANK OF COMMERCE BUILDING, NEW ORLEANS, LOUISIANA • SHEPHERD BUILDING, MONTGOMERY, ALABAMA

LION OIL COMPANY

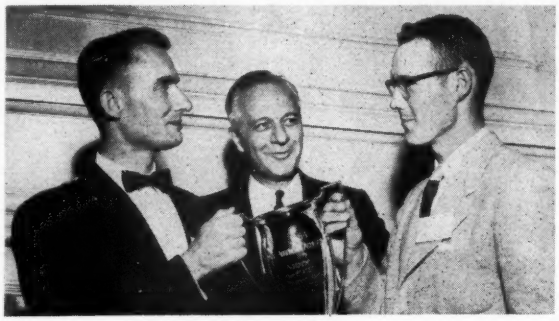
CHEMICAL SALES DIVISION — **EL DORADO, ARKANSAS**

LION

Awards at Agronomy Society Meet

Twenty-four persons were named as fellows of the American Society of Agronomy at its annual meet on Nov. 10. Shown are 11 who were honored for constructive leadership and soil improvement. Front row: R. G. Shands, U. of Wisc.; J. B. Harrington, U. of Saskatchewan; R. H. Bray and O. T. Bonnet, U. of Ill.; J. R. Neller, U. of Fla. Standing: Orville Vogel, Wash. State College; M. A. Hein and F.E. Clark, USDA; S. D. Gray, American Potash Institute; D. R. Dodd, Ohio State U. and W. B. Andrews, Miss. State College.

Winners of the 1954 essay contest for college students in agronomy, sponsored annually by American Potash Institute and American Society of Agronomy. 1st place winner Samuel G. Carmer, Cornell, receives his prize from Jack S. Carter, contest committee chairman. Also shown are Bert L. Bohmont, 2nd place; Robert Dunford, 3rd place; Kenneth Munkres, 6th place; Robert P. Chesney, 5th place. Carmer's winning essay, "Invasion by Rocket" dealt with problems caused by yellow rocket.



The Agronomy Club of Iowa State College has been named the best student agronomy organization of its kind in the U.S. and winner of a trophy and $100 presented by the American Plant Food Council. Dr. Willard H. Garman, council agronomist (left) presents the trophy to the club's president, Galen Rozeboom (right) as Dr. W. H. Pierre, head of Iowa State's Department of Agronomy, looks on. The club received the National Agronomy Achievement award for 1954 at the American Society of Agronomy meeting at St. Paul, Minnesota, in November.

Brush Killers Shown Beneficial to Wildlife

Brush control sprays do not directly harm wildlife if the proper chemicals are properly applied, but actually may help to encourage it through development of small game food and cover, according to results obtained in the first phase of a five-year experiment undertaken by Pennsylvania State University.

Believed to be the first full-scale field test of its kind, the experiment is being conducted by the University's School of Forestry on Pennsylvania game lands. Cooperaters in the experiment are the Pennsylvania Game Commission, Pennsylvania Cooperative Wildlife Research Unit, Pennsylvania Electric co., Asplundh Tree Expert co., DuPont co. and American Chemical Paint co.

Safety Meet Attendance

Twenty-nine states, the District of Columbia and Canada were represented at the Fertilizer section, National Safety Council, meetings in Chicago this year. Largest number of representatives was from Illinois, with 33 persons in attendance.

J. Lauren Shopen, the section's chairman of public relations, reports that the section's goal for 1955 is to have representation from all the states.

The second edition of the WESTERN FERTILIZER HANDBOOK, published by the California Fertilizer Association, now is being distributed. Developed over a period of three and one half years by a sub-committee of CFA's Soil Improvement committee, it is written in easily understood language.

The Handbook now is available, at $1 per copy including tax and mailing charges from CFA, 475 Huntington Drive, San Marino 9, Calif. Because it is not staffed to handle orders on a C.O.D. or billing basis, the association asks that every order be accompanied by cash or check to cover.

Ark. Coop Changes Name

Arkansas Plant Food co. is the new title of the former Arkansas Farmers Plant Food co., fertilizer coop. of the Ark. Farm Bureau Federation. The federation has also changed the trade name of its fertilizer products from Arkansas Quality Fertilizer to Green State Plant Food.

In mid-1954 the company set up its own distribution and sales operation after terminating an exclusive sales contract with the Arkansas Farmers Association.

National Distillers Plant

Purchase of about 3½ acres comprising a portion of a 10-acre waterfront property in Newark, N. J., has been announced by National Distillers Products corp. Work will be started promptly on a new plant to be used by U. S. Industrial Chemicals co. div. for warehousing and distribution of alcohols and other chemicals, stated Lee A. Keane, director of chemical sales for National.

USDA NEWS

Marketing quotas for both upland and extra long staple cotton have been approved by growers, according to preliminary returns. Voting ran 92 and 92.7 per cent respectively. Quotas have also been approved by producers of fire-cured and dark air-cured tobacco.

* * * *

New leaflet: No. 187 on controlling blight of pears and apples, revision of the 1939 publication. Included is advice on use of materials such as zineb and the antibiotics.

* * * *

Regulations have been issued with procedures and requirements applying to sales of surplus agricultural goods for foreign currencies.

* * * *

Additional drought areas announced by Secretary Benson include 13 Michigan counties and 33 in Virginia, Missouri and Nevada.

* * * *

The program for purchase and distribution of limited supplies of foundation seed of improved legumes and grasses will be continued this year. Contracts for purchase of seeds will be offered eligible farmer producers of the seed, and breeder supplies of specified varities will be purchased from ag experiment stations and plant breeders.

* * * *

A USDA statement of policy concerning the relationship of its employees to general and specialized farm organizations has been released. It states, in part, that it is not proper to accept compensation from such groups, that services must be available to all persons requesting assistance or advice and that promotion or solicitation of membership for any organization to secure services of USDA employees is not permitted.

APFC-Grange, AAEA Awards

Delmer E. Groves (left), associate editor of THE OHIO FARMER, and Wallace D. Inman (right), associate editor of CAPPER'S FARMER, winners of the "Soil Builders Award for Editors" with Louis Wilson, director of information and secretary of the American Plant Food Council, who presented the awards. The contest is conducted by APFC in cooperation with the American Agricultural Editors Assn., and the presentation was made at the AAEA meeting on Dec. 1.

David C. Faulkner, 14, (center) of Kenton, O., has been adjudged 1st place national winner of $500 in the 1954 Essay Contest on "Building Fertility to Cut Farm Costs" sponsored by The National Grange and American Plant Food Council. He is shown with Herschel D. Newsom (left), master of the National Grange, and Louis Wilson (right), who presented the award for the council.

At the Chicago Fertilizer Section, NSC Meetings

Ned Dearborn (right) congratulated Vernon S. Gornto, (left), past chairman, and J. Lauren Shopen, Public Relations committee chairman, on the rapid strides the section has made during the past year.

Vernon S. Gornto, the Fertilizer section's past chairman, congratulates Thomas J. Clarke, newly elected section chairman.

On the program at the Fertilizer section meeting were E. C. Perrine, W. H. Henderson, Thomas J. Clarke, John Marx and W. E. Powell. A new high in attendance and interest was set at the recent meeting.

Phosphate Lease Rules

Regulations relating to leasing of public land for phosphate development have been amended by the Bureau of Land Management to permit leasing of fringe acreage to adjoining lease holders on a non-competitive basis under certain conditions.

The conditions are: 1. If the fringe acreage is not of interest to more than one operator and lacks sufficient reserves of phosphate deposits to warrant independent development. 2. The additional acreage would be within the aggregate limitation of 2,560 acres which applies to a single phosphate lease.

Lands are to be awarded only on a competitive bid basis if the fringe acreage has sufficient phosphate reserves to warrant independent development or if there appears to be competitive interest in the acreage.

A proposed resolution on pesticide-fertilizer mixes as related to accident and health control, prepared last June by the Engineering committee of National Safety Council's Fertilizer section, now has been favorably passed by the Executive committee. The resolution states:

"In view of the potential hazards in connection with mixing pesticides with fertilizer, this committee recommends:

"1. Before engaging in such practice the toxic characteristics and the maximum allowable concentrations should be determined;

"2. Any steps necessary to assure adequate protection of the personnel should be taken;

"3. The finished product should be so labeled as to provide proper warning to all who might come in contact with the product after it has left the plant."

College-Business Program

The College-Business Exchange Program for 1955 recently was announced by Dr. W. M. Curtiss of The Foundation for Economic Education, Inc.

The foundation does not charge for this exchange service. Companies select the Fellows they want from a list of candidates and pays each $500, plus transportation to and from their homes. Anyone interested in the exchange program may obtain a complete outline by writing to Dr. Curtiss of the foundation at Irvington-on-Hudson, New York.

Bulk Chemical Storage by the SAUERMAN Method

Reclaiming Triple Superphosphate to Hopper

Overall View of Storage

How Sauerman Scraper Storage Reduces Costs

200,000 tons of triple superphosphate are produced each year in this new Florida plant. It is delivered by overhead conveyor to a 329'x146' storage building of 35,000 ton capacity. The material is then stockpiled and reclaimed by a 2½ cu. yd. Sauerman Scraper at a rate of 150 tph.

Here's how a Sauerman Machine cuts costs:

One operator, located in a safe station overseeing the entire area, can recover practically 100% of all stockpiled material.

All highly machined parts, hoists and motors can be located outside of the building and protected from corrosion and dust.

When parts are replaced—sheaves, clutch or brake linings—the machine is restored to practically new condition, even though it may be twenty or more years old.

Only the Crescent scraper and cables contact the material. The scraper machine can be designed to operate the scraper on top of non-caving material. This allows the scraper to break down any high faces that may be standing.

Sauerman Storage Machines are built for hourly capacities of from 20 to 600 cu. yds. A partial list of chemical producers and manufacturers using some type of Sauerman equipment includes:

Consumers Cooperative Assn.
Crawford Chemical Co.
Davison Chemical Co.
Division of W. R. Grace & Co.
Duval Sulphur & Potash Co.
F. S. Royster Guano Co.
Hi-Yield Fertilizer Co.
International Minerals & Chemical Corp.
Lion Oil Co.
Mississippi Federated Cooperatives (AAL)
Meridian, Miss. Branch
Potash Company of America
Red Star Fertilizer Co.
Southern Agricultural Fertilizer Co.
Tennessee Farmers Cooperative
Virginia-Carolina Chemical Corp.

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City Fert. Plants "Risky Business"

Ray Leary of Milwaukee's Sewerage Commission recently told a Louisville, Ky., group that if Milwaukee had it to do over again, it probably would not choose to get into the fertilizer business. He said Milwaukee had invested some $7,000,000 in its fertilizer plants and turns out from 185 to 200 tons per day. But whereas it made a profit on early operations, last year it realized only $31.89 a ton from fertilizer which cost $38.09 to make.

In a recent issue of the Ohio State Water Pollution Control Board's CLEAN WATERS, the board advised municipalities against attempting to go into the fertilizer business in connection with operation of sewage disposal plants. It notes that the question—Could a city or village sell the sludge from its sewage disposal plant as a fertilizer and perhaps make a profit on the operation of a sewage disposal plant?—is often asked by residents and officials of communities considering the building of sewage treatment plants.

Although it points out that such hopes of minimizing cost of sewage treatment plants in this manner are understandable, the board asserts that "actually there is very little, if any, possibility of selling such wastes."

"To prepare such a fertilizer out of sewage sludge would call for a considerable investment by a community above the cost of the sewage disposal plant and then would merely put the community into a risky business where the danger of loss would be present as well as the opportunity for profit," the Ohio agency reported.

New DuPont Packages

New "weatherproof" packages have been adopted by DuPont co. for its entire line of garden chemicals. Bright yellow enamel on metal tops and bottoms of dust guns and canisters will keep them from rusting and add a colorful touch to the tool shed shelf, says the company. Varnished labels can be handled with wet hands or set down in dewy grass without fear the directions will disappear, and smudges of dirt can be sponged off.

Twelve of the company's garden formulations will be packaged in the weatherproof dust guns and canisters, while the others are packed in glass bottles or weather-resistant paper bags. For the four combination insecticide-fungicide dusts, the weatherproof packages include an eight ounce dust gun applicator package and a one pound canister with a sifter top.

Classified

FERTILIZER SPECIALIST with 25 years experience in tropical soils and crops desires connection with fertilizer firm or raw material producer in North or South America as educational promoter, traveller or salesman. White, age 45, speaks English, Spanish and French. Address "485," care FARM CHEMICALS, Philadelphia 7.

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OVERSEAS

A joint announcement from W. R. Grace & co., Farbwerke Hoechst A. G. and American Home Products corp. reports plans to construct a five million dollar chemical plant at Suzano in the Sao Paulo area of Brazil for production of DDT, industrial solvents, detergents and other chemicals.

A new company, tentatively known as Fongra Produtos Quimicos S.A., is being formed in which Grace and the German concern will have equal participation and American Home Products a lesser part.

Credit of $1,500,000 has been granted by the Export-Import Bank to be used in financing equipment to be acquired in the U. S., and construction will begin early this year. Full production is slated for 1957.

Brazil. Imports of fertilizer are being increased as part of a nationwide campaign to increase food production through expansion of farms and to produce better quality products by improved farming methods.

Cuba. A group of U. S. financiers and Cuban industrialists are discussing plans for an ammonia plant, first such facility for the country. Initial operations would be based on imported petroleum.

Egypt. Production of calcium nitrate was expected to reach 200,000 metric tons in 1954 and a potential capacity of 250,000 tons is scheduled for 1955. Plans are under way for construction of a 370,000 ton ammonium nitrate plant with completion set for 1958.

India. Establishment of at least four more fertilizer plants is contemplated by the Indian government and a committee has been established to make recommendations on expansion of nitrogen facilities. The new units will cost an estimated $160 million.

Israel. ECONOMIC HORIZONS reports that expanded facilities for production of fertilizers and pesticides are underway. A three unit plant has been added by Fertilizers & Chemicals Ltd., of Haifa, for production of phosphoric acid, dicalcium phosphate and potassium sulfate. The company is also building a $3.5 million ammonia plant with 14,000 ton capacity and a 40,000 ton ammonium sulfate unit, both scheduled on stream in May.

At Beersheba, the Makhteshim Chemical Works Ltd. is installing equipment in three pesticide plants. Dicalcium phosphate and potassium sulfate will be exported by the F&C organization.

The DDT plant, erected under an agreement with J. R. Geigy will turn out 350 tons per year of pure DDT, half of which will be exported. The other two units are scheduled to produce 750 tons of copper oxide and 240 tons of 2,4–D, respectively. Portions of these materials will also be exported.

Mexico. Consumption of pesticides may be expected to double in the next six to eight years, according to the Bureau of Foreign Commerce. U S producers can expect to supply technical materials and concentrates until domestic facilities are expanded although the market is not considered a sure bet. French and Belgian competition may be the big factor.

Production and imports were estimated at about 210 million pounds in 1953 and production from some 33 Mexican companies ran somewhat over 171 million.

Netherlands. Fertilizer usage increased in 1953-54, and for the current year a continued expansion in NK and a moderate decline in phosphates is forecast. Next year production of urea will begin at a 55,000 ton N plant at Geelen.

Spain. Consumption of fertilizer during 1954-55 is expected to total 100-125,000 tons N, 250,000 tons P_2O_5 and 75,000 tons K_2O. Spain is self sufficient in all but nitrogen and imports about 70 per cent of that commodity.

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Bingham Succeeds Taylor

Appointment of Harold E. Bingham, director of traffic, as acting director of product sales has been announced by **Spencer Chemical co.'s** Sales div. He succeeds George Taylor, who has resigned.

Bingham

Bingham joined Spencer in 1946 and was responsible for organizing the company's Traffic dept.

To date there is no information on Dr. Taylor's future plans, except that he is reported to have resigned to join a yet unknown chemical company.

People

American Chemical Paint co. has announced three appointments to its staff of research specialists. Dr. L. W. Melander has been named project leader, research development; Richard A. Fosse, Western representative of the Agricultural Chemicals div., Research and Development dept. and John E. Gallagher, research specialist.

Dr. Frederick Halverson has been named section manager for the recently formed Basic Research dept. of **American Cyanamid co.** Newly named group leaders include Drs. G. Warren Kennerly, R. F. Stamm, W. M. Thomas and V. P. Wystrach.

American Potash and Chemical corp. has named Morris Hein senior research chemist, Eston div., and William F. O'Brien, manager of lithium sales for the company. O'Brien will headquarter at the company's New York sales office.

Antara Chemicals div. transfers: L. G. Nunn from the Technical dept. in New York to Chicago as field representative, and O. G. Carpenter from Chicago to New York as assistant to the market manager.

Following the resignation of Dr. J. Peter Kass as director of research, **Atlas Powder co.,** Dr. Robert S. Rose, Jr. was named acting director of the Research dept. Dr. Kass will continue to serve as a special consultant on the company's food research program.

S. M. Spencer has been named assistand manager of **Bemis Bro. Bag co.'s** St. Louis plant and sales div.

Directors of **Butler Manufacturing co.** recently named John A. Morgan to the newly created post of executive vice president and elected Walter L. Smith vice president—engineering and production.

Four assistant district sales managers have been appointed by **Carbide & Carbon Chemicals co.**—R. A. Corio, Newark, N. J. district; R. J. Hughes, Philadelphia district; D. F. Swartz, Baltimore, Md. district and D. H. Merry, Chicago district.

Chase Bag co.'s vice president and general sales manager, W. N. Brock, has been elected president of the Chicago Feed Club for 1955.

H. C. Twiehaus has been named manager of the Planning dept. for **Columbia-Southern Chemical corp.** Prior to his appointment, he had been director of development for the firm's Natrium, W. Va., plant. He will make his headquarters in Pittsburgh.

Ellis

Sydney T. Ellis, **CommercialSolvents corp.** administrative vice president, has been named executive vice president of the company. Associated with CSC since 1951, he has been a member of the board of directors since 1953.

Following the merger of the The Dorr co. of Stamford, Conn. and Oliver United Filters of Oakland, Calif. into **Dorr-Oliver Inc.** on Jan. 1, C. W. Crumb, sales promotion manager for Oliver will take over the same responsibilities for the joint corporation; C. M. Comstock, Dorr asst. advertising manager, will become assistant sales promotion manager for Dorr-Oliver; A. L. Morris, advertising manager for Dorr, will assume responsibilities of director of public relations for the new firm and R. D. Forger, technical assistant in Dorr's Advertising dept. will transfer to Dorr-Oliver public relations.

Company headquarters will be in Stamford, Conn.

Died: Morton S. Hodgson, president of **Empire State Chemical co.,** Athens, Ga., on Dec. 4. He was a director of NFA from 1948 until his death.

George H. Serviss, **G. L. F. Soil Building Service** agronomist, has been named chairman of the Division of Fertilizer and Soil Chemistry, American Chemical Society.

L. R. Modlin has been named field sales manager, General Chemical Sales dept., **B. F. Goodrich Chemical co.** The former staff representative will be in direct charge of all general chemical field sales.

Newly elected directors of **W. R. Grace & co.** are James J. Minot of Paine, Webber, Jackson & Curtis, and Philip L. Reed, Dewey and Almy. The head of Dewey & Almy div. of Grace, Hugh S. Ferguson, has been named a W. R. Grace vice president.

John T. Minor has joined the Chemical Research group of **Grand River Chemical div.,** Deere & co., as a senior chemist. He formerly was with Commercial Solvents corp.

International Minerals & Chemical corp.'s Bonnie chemical plant production manager, James A. Wilson, has resigned to become manager of Kaiser Aluminum co.'s alumina plant at Baton Rouge. William Bellano, who has been appointed production manager of the Phosphate Chemicals div., will be in charge of the Bonnie plant and also be responsible for IM&C's phosphate chemicals operations at Tupelo, Miss., and Wales, Tenn.

Promotion of Neil B. O'Donnell to assistant manager of production and Robert V. Safford to assistant manager of engineering and maintenance at Bonnie also was announced. James F. Roe will succeed O'Donnell as superintendent of the Bonnie plant.

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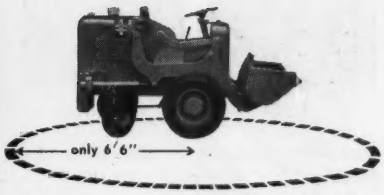

5" shorter turning radius (only 6'6") and faster speeds up to 13.88 mph in reverse, 7.66 forward.

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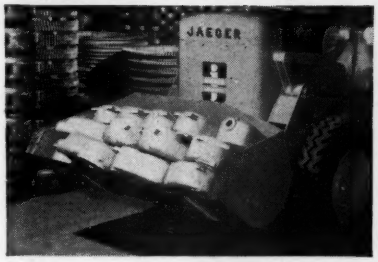

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Higher dumping clearance of 4'6" under lip; 6'8" under hinge. Longer reach of 2'7".

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Bigger lifting capacity helps you handle heavier loads. Shortest turning radius speeds work in narrow aisles, box cars, cramped quarters. Highest dumping clearance and longer reach give greater range of load placement. Faster speeds, both forward and reverse, cut maneuvering and travel time. Independent forward-reverse control permits instant changes in direction, quick get-away.

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For complete facts, send for Catalog L12-4 and name of distributor who sells and services the Jaeger Auto-Scoop in your city.

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Two recent additions to **International Minerals & Chemical corp.'s** Phosphate Chemicals div. are Bryce L. Rhodes and H. Clair Dyer,

Dyer

Rhodes

announced Howard F. Roderick, vice president in charge of the division.

Rhodes has been named development manager while Dyer has been made eastern area sales manager for the division's Special Products dept.

Koppers co. has announced the appointment of Dr. A. R. Powell as acting manager of the Central Research dept., following the resignation of Dr. G. F. D'Alelio.

Marshall Parker has joined **Larvacide Products, Inc.** to work with George Marks out of the firm's San Francisco office.

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LeRoi div. of Westinghouse Air Brake co. has named Don S. Permar to the newly created post of field sales manager.

Election of a new vice president in charge of operations was announced by **Michigan Chemical corp.** following its board of directors' meeting Dec. 3. He is Fred A. DeMaestri, former technical supervisor of Ehret Magnesia Manufacturing corp.

The company also announced the appointment of Robert J. Nulph as an analytical research chemist.

New chairman of the Division of Agricultural and Food Chemistry, American Chemical Society, is W. O. Lundberg, executive director of Hormel Institute and professor of agricultural biochemistry at the **University of Minnesota.**

Monsanto Chemical co. appointments: William J. Katt, manager of the new Instrumentation and Electrical Engineering section, Engineering dept., Organic Chemicals div.; Dr. Edward N. Rosenquist, director of personnel, Research and Engineering div.; John W. Mashek, assistant manager of the Engineering dept.'s Design section; Walter G. Canham, assistant manager for the department's Process section.

Following integration of all **National Distillers Products corp.** chemical activities into one Chemical div. the firm announced the appointment of Lee A. Keane as director of chemical sales; Robert H. Cornwell, director of production and Dr. Stuart Schott, director of research for the division.

Dr. Wesley S. Coe has been named assistant to John E. Caskey, vice president and general manager of **Naugatuck Chemical div.,** U. S. Rubber co. Dr. Coe is succeeded as assistant factory manager of the chemical and synthetic rubber plants in Naugatuck by Dr. J. N. Judy.

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S. W. Grossmann has been named assistant chief engineer for **Nitrogen div.'s** Development dept. in Hopewell, Va.

Nopco Chemical co.'s newly-appointed assistant vice president is Harold A. Swanson.

W. C. Davis has been named Detroit, Mich., district manager by **Pennsylvania Industrial Chemical corp.**

Pennsylvania Salt Manufacturing co. of Washington has announced the appointment of Arthur F. Bixby as manager of agricultural chemicals. A graduate of the University of Massachusetts with 16 years of Pennsalt service, Bixby was promoted from assistant manager, a position he had assumed in July, 1954 after Pennsalt agricultural chemicals activities were transferred to Tacoma, Wash.

Bixby

Pittsburgh Coke & Chemical co. promotions: Dr. R. C. Scott to assistant to H. F. Tomasek, manager of the Agricultural Chemicals div.; Dr. J. B. Skaptason to coordinator of biological research and Gordon M. Williams to agricultural chemical research supervisor.

Scott

In his new position Dr. Scott will be concerned with coordinating the division's technical activities as related to commercial development.

Shelton Appleton has been named sales representative for **Potash Co. of America** in Texas, Louisiana and a portion of Arkansas. His headquarters are at 105 Preston St., Shreveport, La.

Newly appointed research engineer for **Swift & co.'s** Plant Food div. is Kenneth L. Olson. He will be located in the company's Calumet City, Ind., research lab.

Died: Carl B. Peters, 67, on Nov. 20 in New York. He was a founder and former president of **Synthetic Nitrogen Products corp.**

Tennessee corp. has appointed E. H. Shelton, former sales manager at

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Atlanta, to the newly created position of general sales manager with offices in New York. L. S. Kaniecki was promoted to manager, chemical sales, and H. G. Cunningham, assistant manager, chemical sales, with offices in Atlanta. R. W. Alexander was named assistant general manager of the Lockland, O. plant.

Carls

As a result of the recent expansion and streamlining program in Velsicol corp.'s Sales and Merchandising depts., Lawrence E. Carls has been appointed advertising manager of the firm, announced John F. Kirk, vice president and director of sales.

Carls formerly was advertising manager for International Register co.

Died: Leonard Wallach, 40, president of Wallach-Gracer Export corp.

Robert Allard, former manager of Fresno Agricultural Chemical co.'s Insecticide dept., has been named manager of the Agricultural dept. for **Wilbur-Ellis co.**

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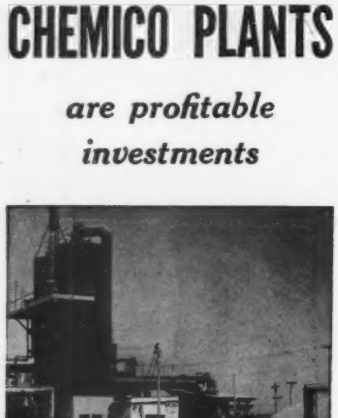

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Company Briefs

Plans for construction of another laboratory building at its Wilmington, Del., experiment station have been announced by **DuPont co.** To cost about $1,815,000, the building will be used by the company's Organic Chemicals and Explosives departments. Completion is expected in 1956.

On Jan. 1, **Food Machinery & Chemical corp.'s** subsidiary, Buffalo Electro-Chemical co. will be merged with the parent company, and will be known as the Becco Chemical div., the company has announced.

FM&CC has also announced that certain research activities formerly performed by its San Jose Central Research dept. have been transferred to laboratories of its chemical divisions.

Freeport Sulphur co. is reported planning a potash mine at Carlsbad, N. M., to cost about $15 million.

Construction has been started on a $2.5 million Frasch process plant by **Gulf Sulphur corp.** to produce sulfur in Mexico, according to a recent report.

Lummus co., Canada, Ltd. will erect a sulfuric acid plant with daily capacity of 100 tons for **Inland Chemicals, Canada, Ltd.** at Fort Saskatchewan, Alberta. Pure sulfur produced by Shell co. Canada Ltd. at its Jumping Pound natural gas treating plant will be used as feed stock.

Eleven acres of land south of Massena, N. Y. and adjacent to the proposed St. Lawrence River Seaway power project have been reported purchased by **Allied Chemical & Dye corp.** for $17,000.

Butler Chemical co. has been formed to take over operations of Gulf Chemical co., according to a notice sent to Gulf creditors by George Butler, a Houston, Tex., lawyer.

Engineering survey work for **Columbia River Chemicals'** $12 million plant near Attalia is being done by Fluor corp., contractor for the fertilizer and chemical plant.

A dividend of 25 cents per share was declared by **Commercial Solvents corp.** in November, payable on Dec. 30 to stockholders of record at the close of business on Dec. 10.

New offices have been opened at 630 Fifth Ave., New York City, by **Continental Oil co.'s** Petrochemical Sales dept.

Negotiations for purchase of 50 per cent of American Sulphur & Refining's new 100 ton-per-day sulfur plant, now under construction at Sulphurdale, Utah, have been completed by **Continental Sulphur & Phosphate corp.,** stated R. Dawson Hughes, Continental president, recently.

Effective at the close of business, Dec. 31, 1954, the Dorr co. of Stamford, Conn., and Oliver United Filters Inc. of Oakland, Calif. merged under the name of **Dorr-Oliver Inc.,** with headquarters at Stamford, Conn.

An expansion program, including new manufacturing facilities to produce granulated, mixed fertilizers, is underway at **Lincoln Service & Supply, Inc.'s** Grand Island, Neb. plant, according to an announcement by Howard Peterson, company president.

The granulating process being installed was developed by The D. M. Weatherly co. Design and initial operations are being carried out by the Weatherly organization.

Fire caused an estimated $30,000 damage at **Louisville Fertilizer & Gin co.'s** Louisville, Ga., plant, according to a recent report. Cause was said to be an overheated motor.

Frank R. McFarland has joined **Miller Chemical & Fertilizer corp.,** Baltimore, to act in an advisory capacity to farmers in the area.

At the recent meeting of the Synthetic Organic Chemical Manufacturers Association, **National Distillers Products corp.'s** vice president, Dr. Robert E. Hulse, stated that his company aims to be among the top ten chemical companies within the next few years.

National Research corp. and **Nopco Chemical co.** have announced their consideration of a program whereby National Research will offer its preferred and common stock to Nopco stock holders in exchange for Nopco common. Effectiveness would be contingent upon exchange of at least 80 per cent of Nopco outstanding stock, it was stated.

One hundred year notes in the amount of $126 million, have been sold by **Olin Mathieson Chemical corp.** to the Prudential Insurance Co. of America. Proceeds of the sale will be used to retire 20 and 25 year notes now outstanding in the same amount.

The corporation has established a series of awards for winners of the 1954 production and marketing contest of the National Junior Vegetable Growers

Association. Merchandise awards of high analysis fertilizer provided by the firm were to be presented at the association's 20th annual national conference in Cincinnati during December.

Under an agreement with Canadian Industries, Ltd., Pennsylvania Salt Manufacturing co. has established **Pennsalt Chemicals of Canada** to serve Canadian markets through sales office and warehouse facilities in Hamilton, Ont.

Dr. Phillips' citrus grove holdings in central Florida have been sold by the **Dr. Phillips co.** to Granada Groves corp. This 2,500 acre sale was said to be one of the largest single citrus grove transactions in Florida.

A 50 year charter of incorporation has been granted **Port Fertilizer and Chemical co.** at Los Fresnos, Tex., listing capital stock of $50,000. Incorporators are Ruby T. Tandy, Cleve H. Tandy and Clyde Tandy, Jr.

A small pilot plant is being built by **Shell Oil co.** in the Okotoks sulfurous gas fields near Calgary. Purpose is said to be to determine applicability of a new method of scrubbing sour gas.

In December, **Simplot's** Fertilizer div. celebrated its 10th anniversary, and Roy Rice, the plant's machinist, observed his 10th anniversary with the division.

Tom Hancock has joined the company's engineering staff, and Ken Williams, foreman, who has resigned to develop his uranium property, will be succeeded by A. R. Powers.

Smith Douglass co. again reports that its Houston, Tex. team leads the company's Safety League with no lost time accidents in 145,888 man hours during Jan. 1—Oct. 31, '54. The company's overall accident frequency rate for the period was 4.39, with 10 lost time accidents in 2,276,070 man hours.

More than 7,000 acres in the Gulf Coast area have been leased by **Sulphur Exploration co.**, including 2,100 acres on Hockley Dome in Harris county, Tex. Drilling will be begun as soon as the company's stock has been sold, it was stated. Officers of the new company include Marvin Weaster, formerly with Duval Sulphur & Potash co., president; Jerome Solomon, vice president; Irvin Kaplan, secretary and Michael S. Spolane, treasurer.

Swift & co.'s net income for the fiscal year ended Oct. 30, 1954, was $19,040,891, a sharp decline from the $33,903,294 reported for the preceding 12 month period. The company's modernization and improvement program moved rapidly ahead in 1954 with a net increase in fixed assets of $14,139,192.

Thompson Chemicals corp. is offering each of the country's 3,000 Garden Clubs a plaque to be presented to a person chosen by the club for her contribution to community betterment through gardening.

United Gas corp. is reported planning a $28 million petrochemical plant at Pensacola, Fla.

Construction work on **U. S. Steel corp.'s** new ammonia plant at Geneva, Utah, is scheduled to begin early this year.

General offices of **Victor Chemical Works** in Chicago have been moved to 155 North Wacker Drive from 141 West Jackson Blvd. New telephone number: DEarborn 2-4010.

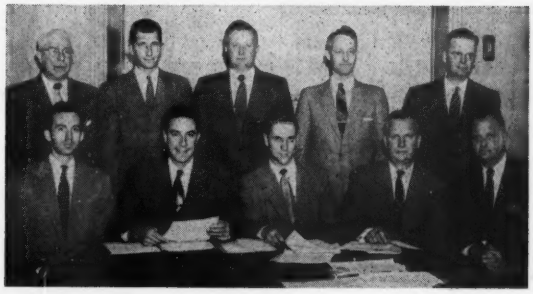
After the MS Buffalo, operating for **Wilson & George Meyer & co.**, arrived in Port Hueneme, Calif., with a cargo of calcium nitrates from Norway, county dignitaries, shipping and industrial representatives were guests at a shipboard party, where informal discussions were held as to the possibility of shipping more nitrates here from Norway.

Associations & Meetings

NE Weed Control Conference Set

Representatives from state agencies, industrial producers and consumers of chemicals have again cooperated to develop the Northeastern Weed Control conference, the 1955 meet to be held on Jan. 5, 6 and 7 in the Hotel New Yorker.

It has grown steadily in scope and attendance since its inception in 1947, and this year enrollment is expected to surpass the 492 present for the 1954 conference.



Conference Executive committee. Standing: W. W. Smith; Arne Carlson; D. A. Schallock, treasurer; C. L. Hovey; L. L. Danielson. Seated: R. A. Peters; A. O. Kuhn, president; R. J. Aldrich, secretary; J. D. Van Geluwe, vice president; R. H. Beatty.

Devoted primarily to presentation of papers on research, development and extension phases of chemical weed control, any person is welcome to submit a paper for presentation or to attend the conference by paying the registration fee, reports Robert A. Peters, Public Relations committee chairman. Of particular importance is the Coordinating committee's report, a summary of opinions requested from all those known to be working on research and development of weed control chemicals in the Northeastern area.

Plans for Midwest Meet

Tentative program plans have been announced for the annual joint meeting of Midwestern agronomists and fertilizer industry representatives at the Palmer House, Chicago, on Feb. 17 and 18. Sponsored by the Middle West Soil Improvement committee, the meeting is expected to draw an even larger attendance than last year, with more than 400 persons gathered to hear the program.

A round table discussion of ways to cut cost of production of corn, wheat and other small grains and forage crops as well as reports of specific research results and a report of new developments in fertilizer technology have been planned.

Dr. F. W. Smith of Kansas State College will be meeting chairman. H. S. Vorhes, MWSIC president, and Z. H. Beers, executive secretary, will welcome the soils men and visitors.

While the meeting is primarily for agronomists and fertilizer industry men, other interested persons have been invited to attend.

NOW! Cash in on liquid nitrogen solution boom

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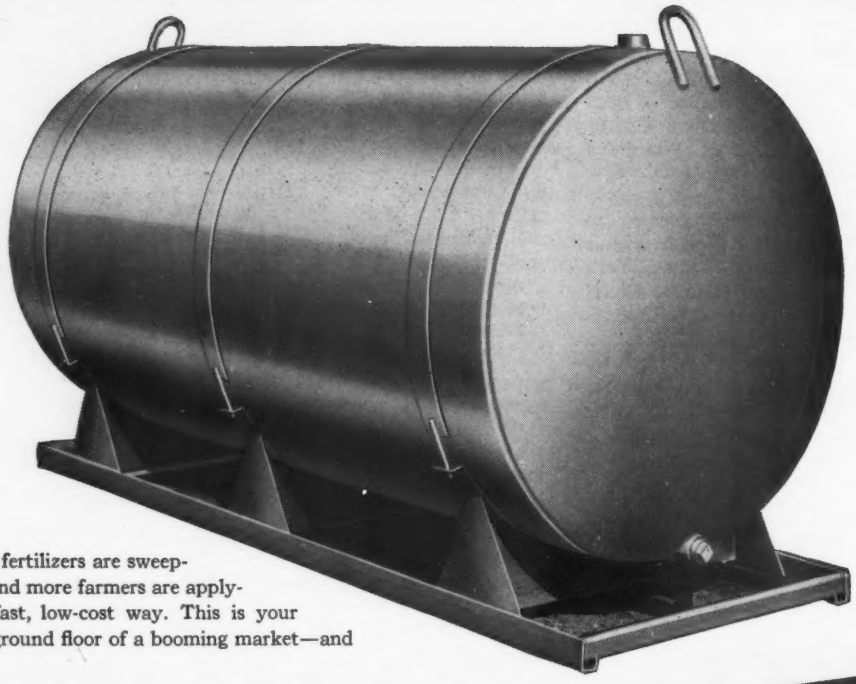


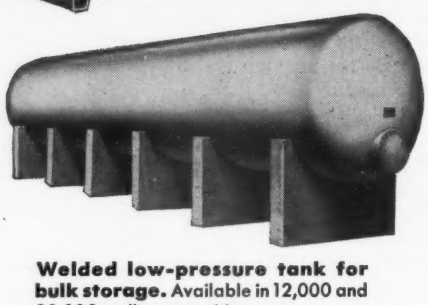
Welded low-pressure skid tank for on-farm storage. Available in 500, 830 and 1000-gallon capacities. Others (without skids) from 100 to 1000 gallons.

Liquid nitrogen solution fertilizers are sweeping the country! More and more farmers are applying nitrogen this new, fast, low-cost way. This is your chance to get in on the ground floor of a booming market—and profit as demand soars!

Butler now offers two types of special alloy non-corrosive aluminum bulk storage tanks for nitrogen solutions: (1) Bolted vertical 22,000-gallon tanks for non-pressure solutions; (2) Welded horizontal 12,000 and 22,000-gallon bulk storage tanks for low-pressure solutions.

Smaller size horizontal aluminum tanks in 100, 270, 500, 830 and 1000-gallon capacities are also available. The 500, 830 and 1000-gallon tanks can be factory-equipped with skids for on-farm storage or transporting solutions from bulk station to farm.

Act now and cash in! Send coupon today for full information.



Welded low-pressure tank for bulk storage. Available in 12,000 and 22,000-gallon capacities.

Bolted 22,000-gallon non-pressure tank for bulk storage.

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Miss. Insect Conference

Mississippi will hold its first Insect Control conference on Jan. 6 and 7 at Mississippi State College.

Included on the first day's program are panel discussions on controlling insects of small grain and pastures, livestock, vegetables and fruit, and household. Subjects of panels the second day will be regulatory; relations between research, extension and industry; application methods and problems and factors and causes of insect control failures.

An outline of the Federal research program on forest insects will be given by L. W. Orr, chief, Div. of Forage Insect Research, New Orleans.

Members of the committee planning the program are A. G. Bennett, extension entomologist; L. H. Mosely, district extension agent; J. F. White, Shell Chemical co.; Norman Downey, Hercules Powder co. and Dr. M. E. Merkl, Federal entomologist.

Western Cotton Program

The Western Cotton Production conference has been scheduled for March 8 and 9 at Hotel Westward Ho in Phoenix, Ariz., the National Cotton Council has announced.

Intended primarily to provide growers with up-to-date information on best methods of producing cotton in California, Arizona, New Mexico, the El Paso area of Texas and Nevada, the meeting is sponsored cooperatively by the Southwest Five-State Cotton Growers Association, the Arizona Cotton Growers Association and NCC.

Michigan Symposium

A Centennial Symposium, "Nutrition of Plants, Animals and Man," will be held on Feb. 14–16 in commemoration of the centennial year of Michigan State College.

To be sponsored by the School of Agriculture, the program includes speakers with national and international recognition. The first day's program will be devoted largely to consideration of the chemical composition and nutritional quality of plants.

Great Plains AAA Officers

Officers for 1955 were elected at the annual business meeting of the Great Plains Agricultural Ammonia Association on Nov. 3 at Omaha, Neb. President is B. A. Frankl, Mor-Gro Inc.; 1st vice pres., George Gigstad, Nortonville Nitrogen Fert. co.; 2nd vice pres., Bob Jeep, Mid-West Fertilizer co.; secretary-treasurer, James H. Andrew, Andrew Farm Store and directors, E. W. Thomas, Farm Service corp.; Charles Bourg, PV-82 Inc. and G. J. Schladweiler, Farmers Fertilizer & Supply co.

The organization is composed of more than 300 anhydrous ammonia producers and distributors and manufacturers of anhydrous NH_3 storage and applicating equipment.

Annual GPFES Meeting

The annual meeting of Georgia Plant Food Educational Society is scheduled for Jan. 18 in Athens, Ga. Highlights will include a discussion of the credit issue and the fertilizer industry with guest speakers Harold Dinges of Spencer Chemical co. and Henry S. Cohen, Moultrie National Bank and the banquet with Dr. George Smith of the University of Missouri as speaker on "Building Soil Fertility as a Basis of High Crop Production."

The Georgia section of the American Society of Agronomy will jointly sponsor the banquet and evening program. Their annual program will follow on Wednesday, Jan. 19.

Ohio-Ind. Aerial Conference

The fourth annual Ohio-Indiana conference on the use of aerial equipment in agriculture will be held at Purdue University. Lafayette, Ind., Feb. 23–25.

Four program sessions—general, entomology, agronomy and mechanical—are scheduled. The annual banquet will be held Thursday night, and on Friday equipment will be demonstrated at Purdue University Airport.

There will be an exhibit room for insecticides and equipment at the airport, and persons wishing space, for which there is no charge, should write to J. J. Davis, Dept. of Entomology, Purdue University, Lafayette, to insure space needs.

Plant Maintenance Meet

Human relations aspects of factory upkeep will highlight the Plant Maintenance & Engineering conference to be held on Jan. 24–26 in Chicago, according to Clapp & Poliak, Inc., producers of both the conference and Plant Maintenance and Engineering show which is scheduled for Jan. 24–27.

CHEMICALS

Soluble Versen-OL

Soluble Versen-OL Concentrate from Versenes Inc. is available in three forms —in one pound tins; absorbed into vermiculite for direct application or mixing with other fertilizers, packed in 50 lb. bags; and in pure concentrate form for mixing with other fertilizers, packed in 50 lb. bags, according to a recent release.

Unlike the old Versene Iron Chelate, it will work in both acid and alkaline soils, but as the pH of the soil increases, quantity applied must also be increased.

The Versenes organization recently was purchased by Dow Chemical co.

New Acme Pesticides

Four new items have been added to the small package insecticide line of Acme Quality Paints, Inc.—Acme Rose Dust, Fly Bait, Garden Fungicide and Dieldrin "18".

The rose dust, packed in an 8 ounce pump gun and a 2 lb. carton, contains 7 per cent captan, .75 per cent Karathane, 4 per cent malathion and 5 per cent DDT. Two per cent technical Malathion and attractants are included in the fly bait, packaged in 1 lb. and 5 lb. sizes, while the garden fungicide, offered in ½ lb. packages which make 15 gallons of spray contains 30 per cent captan and 3 per cent Karathane. Acme

Dieldrin "18" is packaged in 8 oz., quart and gallon sizes and contains 18.62 per cent technical dieldrin.

More on Ringwood Chemical

Since brief mention of Ringwood Repellent was made in this section in December, additional data have been received from Lester J. Perlman of Ringwood Chemical corp.

He reports that an aqueous formulation is now being developed by the company and is expected to be available this year. At the present time the repellent is not recommended for use on growing trees or evergreens; however, Perlman states, the aqueous formulation should overcome this limitation.

Ringwood Repellent is a free-flowing solution of 5 per cent TNB-A in acetone which may be applied by brush or spray to dormant deciduous trees to repel rabbits.

New DuPont Formulation

DuPont co. will have a new chemical combination for roses on the market this year. Called DuPont Rose Insecticide and Fungicide, it succeeds DuPont Rose Dust and contains methoxychlor, lindane, aramite, fermate and the Massey formula of sulfur.

Like the company's other garden products, the new product will be packaged in new weatherproof containers and will be available in an eight ounce dust gun, one-pound canister and three-pound weather-resistant bag.

Cellusan Wood Preservative

Darworth Inc. has announced a water repellent wood preservative called Cellusan.

As a fungicide it protects wood and canvas against micro-organisms which cause decay and mildew and also con-

Untreated **Treated**

trols contamination of the most delicate crops, according to the producer.

As a water repellent, Cellu-san provides effective protection for crop gathering equipment through scientific control of moisture content in the wood.

Applied by a 3-second dip application, Cellu-san has received the highest approval rating of The National Wooden Box Association.

Shattuck Molybdate (RS 34)

Working samples of sodium molybdate for use as a farm chemical have been offered by Millmaster Chemical corp., eastern sales agent for S. W. Shattuck Chemical co.

In Australia and New Zealand, treating the soil with molybdenum has greatly reduced, and in many cases entirely eliminated, the need for liming, according to a recent release. For pasture and hay legumes, two ounces of sodium molybdate may replace several tons of limestone.

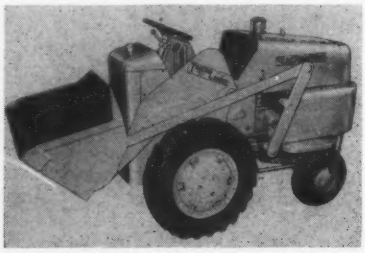
In Florida, spray treatments with the chemical were recently introduced to cure "yellow spot" of citrus, and its use in the spray program has now almost completely eliminated the disease, states the report.

For a working sample of sodium molybdate, circle 34 on the Reader Service card.

Equipment & Supplies

TL-6 Tracto-Loader (RS 35)

The TL-6 Tracto-Loader from Tractomotive corp. weighs 6,000 pounds and is equipped with a combination clutch type transmission and torque converter drive. The bucket is rated at ½ cu. yd. and, in addition to the automatic



tip back during the boom raising cycle, the bucket can be tipped back 21° at ground level.

Powered by an Allis-Chalmers B-125 engine which develops 33.7 horsepower at the governed speed of 1900 RPM, the machine's overall length with the bucket at a 3 foot carry position is 10' 1" and the overall width is 4' 5".

For more information on the TL-6, circle 35 on Service card.

Rotocycle Meters (RS 36)

A new series of stainless steel Rotocycle meters designed especially to handle corrosive liquids has been introduced by the Meter and Valve div., Rockwell Manufacturing co. The series includes two inch, 100 GPM and three inch, 200 GPM bulk plant models and two inch pipeline models. All wetted meter parts are made of type 316 stainless steel and bushings are of hard carbon, ball bearings of stainless steel.

For illustrated literature, circle 36 on Reader Service card.

Saco Bag Conveyor (RS 37)

A heavy duty unit designed for handling bags, boxes and cartons, the Saco Sectional Bag Conveyor, is now available from Stephens-Adamson Mfg.

co. in 18 or 24 inch belt widths with standard 20-foot interlocking sections. Designed for fixed horizontal conveying, the units can be easily adapted for portable or inclined conveying.

For complete information on the Saco Sectional Bag Conveyor, circle 37 on Reader Service card.

Baughman Bulkmobile (RS 38)

The newly designed Bulkmobile is Baughman Mfg. co.'s latest answer to the growing trend toward bulk material handling and transportation. Models are available in lengths from 15 feet to 33 feet, with body sides up to 36" high.

According to the manufacturer, this automatic, self-unloading unit will save

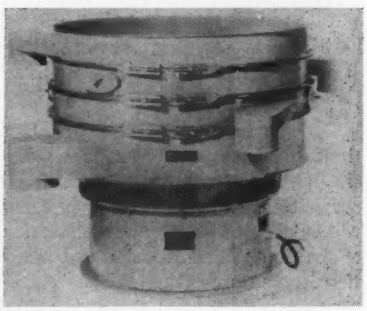
as much as 75 per cent on handling time, as well as large savings on the bulk material itself.

Rapid discharges, ranging from ½ to 2 tons per minute, are possible, depending on the weight of the material and method of discharge.

For further information, circle 38 on Reader Service card.

SWECO Separators (RS 39)

New, tangential discharge spouts are now replacing rectangular shape spouts, on SWECO Vibrating Screen Separators, reports Southwestern Engineering.



The new shape spouts permit greater efficiency and speed to develop in in material as it spirals out on screen and through discharge at frame wall.

The separators utilize a gyratory motion imparted by a vertically mounted motor.

For additional information, circle 39 on Reader Service card.

For information on numbered items use the Reader Service card

HFC Payloader (RS 40)

An improved Payloader tractor-shovel with bucket capacity of 1 cu. yd. Payload and ¾ cu. yd. struck load has been announced by The Frank G. Hough co. Designated as the Model HFC, it is a rearwheel drive model and features a combination of a special new Hough-built transmission plus torque-converter drive.

Hough says some of the advantages which the torque converter adds to the HFC's operation include substantial reduction in the amount of gear shifting and clutching and less concentration and effort on the part of the driver.

For full information on the Model HFC circle 40 on Reader Service card.

Sargent Portable Dryer (RS 41)

C. G. Sargent's Sons corp. has announced that a new, portable, completely self contained dryer which it designed and manufactured is now available to industry and university laboratories on a rental, rental-purchase or outright purchase basis.

The full size, fully instrumented dryer uses either steam-heated or electrically heated air. Heavy duty ball bearing casters on which it is conveniently mounted lock securely when dryer is positioned at the job or in the laboratory.

For additional information, circle 41 on Reader Service card.

pH Determination (RS 42)

A new, accurate method of cutting the electrode standing time in multiple soil pH determinations has been developed by the Department of Soils, Ontario Agricultural College, which makes some 25,000 soil pH measurements annually.

Ordinarily from 5 to 15 minutes are required for the pH meter electrodes to stand in the soil solution. It is reported that the new method, which uses a Beckman Model H-2 pH Meter, cuts the time down to 20 seconds or less and eliminates the need for a fixed soil-water ratio.

For a complete description of the method employed by Ontario Agricultural College, circle 42 on Reader Service card.

Penco Steel Ramps (RS 43)

Penco steel ramps in both car loading and truck loading safety types now are available either at New Jersey or California shipping points.

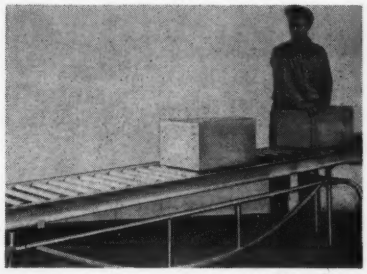
Features of Penco steel ramps, such as modern design, all-welded construction, safety side guards and positive locking, are emphasized in a new bulletin from the company.

For a copy, circle 43 on Reader Service card.

Magline Conveyor (RS 44)

Constructed entirely of magnesium, the new, portable roller conveyor recently announced by Magline, Inc. weighs from 15 to 40 per cent less than comparable equipment of similar size and capacity, states the company.

Suitable for permanent installation or for portable use, the conveyors can be



easily set-up or dismantled by one man. They are available in two capacities: 500 lb. and 900 lb., with roller sizes ranging from 12 inches to 20 inches.

Additional information will be sent to you if you circle 44 on Reader Service card.

Neoprene Sheet Lining (RS 45)

Neoprene No. 750 Sheet Lining has been added to the product line of Carboline co.

Supplied in rolls 32 to 34 inches wide in varying lengths and thicknesses, the lining is used in transportation, storage and handling of acids, plating solutions, alkalies and various inorganic salt solutions at temperatures up to 190° F. Because of the lining's abrasive toughness, the company recommends it for lining agitating and mixing equipment.

Additional information and prices will be sent to you if you circle 45 on Reader Service card.

Crippen Labs Bulletin

Raymond C. Crippen Research and Development Laboratories has prepared Bulletin No. 1, "Feeds, Feedstuffs—Grains" which quotes prices for standard analyses, medicated feeds and drugs, mineral determinations, vitamins and amino-acids and miscellaneous tests. Copies are available by writing to the laboratories at 1138 E. North Avenue, Baltimore 2, Md.

Suppliers' News

Here are some of the Fulton Bag & Cotton Mills executives, branch managers and sales personnel who met recently in Chicago to discuss plans for the coming year.

The first multi-stage bleach plant of its kind in this country, using chlorine dioxide, now is in operation at St. Marys Kraft corp. plant at St. Marys, Ga. With this addition to its pulp, paper-making and converting equipment, **Gilman Paper co.**, through its subsidiaries, achieves complete integration at both the St. Marys, Ga., and Gilman, Vt. mills.

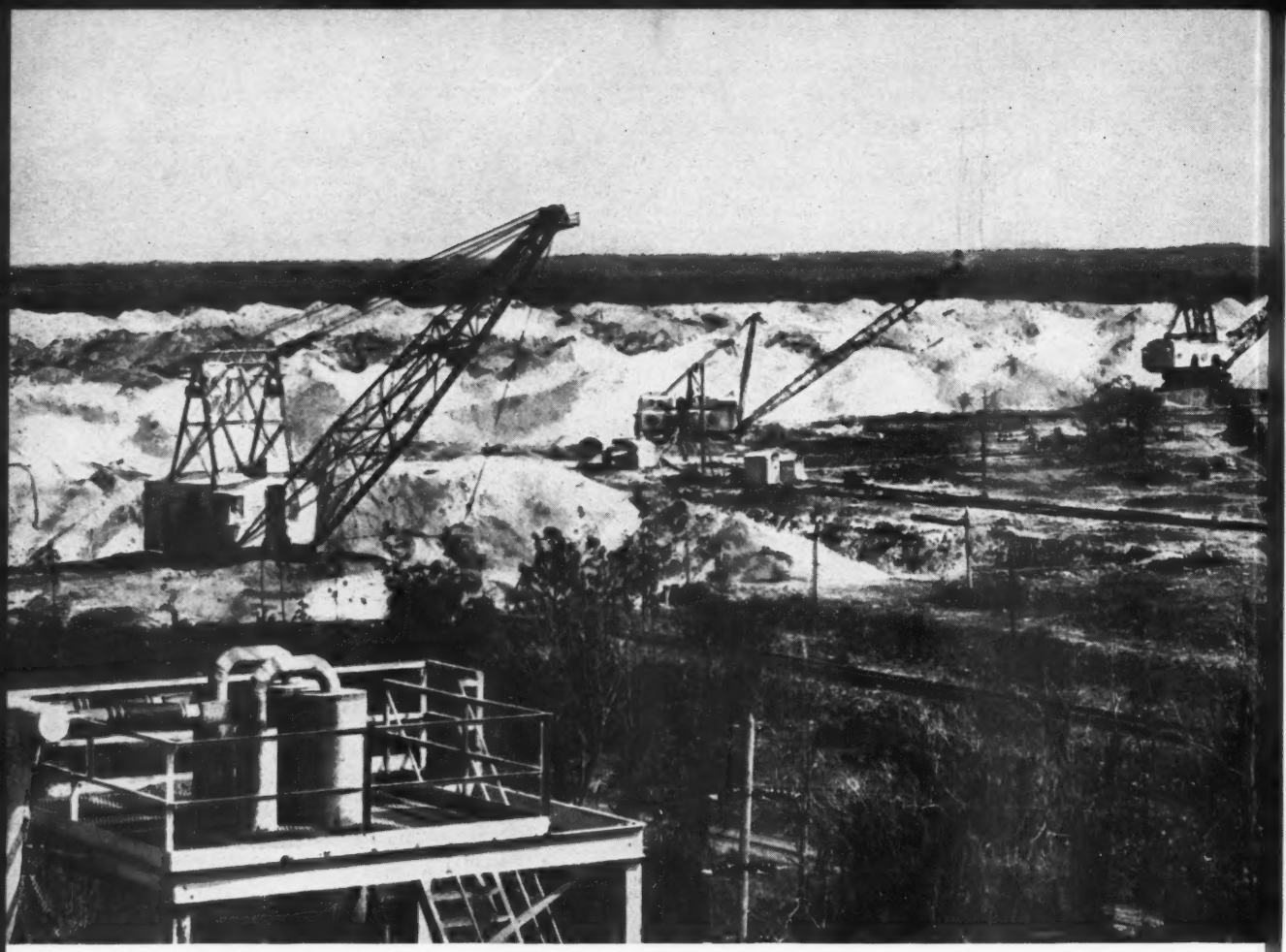
Realignment of its Multiwall sales force has been announced by **Hudson Pulp & Paper corp.'s** multiwall sales manager, Julian Mendelsohn. Under the new regrouping, each salesman now concentrates his efforts in a single product division.

An Industrial Packaging Design and Manufacturing div. has been formed by **Mountain Waterproof Papers, Inc.**, to design and manufacture to users' specifications semi-machine and hand-made paper bags, covers, hoods, liners, slips and a complete line of industrial packaging materials and products.

Joseph F. Gill is plant manager and A. C. Clough, Jr., general sales manager of the new division, with offices in Worcester, Mass. and Malvern, Pa. Ward Giles has been named plant superintendent in charge of production and John F. McGowen, sales representative.

Rietz Manufacturing co. has opened offices in the Forsyth Building, Atlanta, Ga. Under the supervision of Arch B. Dunwody, the new office will serve Georgia, Kentucky, Tennessee, Mississippi, Alabama, Florida, North Carolina and South Carolina.

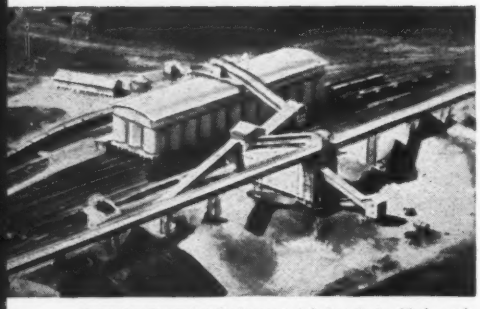
Underwriters' type EE rating has been awarded to **Yale & Towne's** K-51 series of electric industrial trucks. These trucks, from 3,000 to 10,000 pound capacity, meet all requirements prescribed by Underwriters' Laboratories, Inc., for the type "EE" classification which has been adopted by the National Fire Protection Association for materials handling operation in semi-hazardous areas.



Three of the A.A.C. Co's electrically-operated draglines at work at our phosphate mines in Central Florida. Bucket capacities range from 9½ to 17 cubic yards. The 17-yard draglines with their 175-foot booms each weigh more than a million and a half pounds and can move 35,000 tons of material in 24 hours. From these rock deposits flow a continuous stream of high quality phosphate rock, assuring a dependable source of supply of AA QUALITY phosphorus products, see list below.

AA Quality...

for over 85 years a symbol of quality and reliability



From the air—wet rock storage and drying plant, with dry rock storage silos in background. These silos, 29 in number, have a total capacity of 40,000 tons of dried rock. Under the silos are four runways where 40 railroad cars can be loaded at a time.

principal AA QUALITY products

All grades of Florida Pebble Phosphate Rock
AA QUALITY Ground Phosphate Rock
All grades of Complete Fertilizers **Superphosphate**
Gelatin **Bone Products** **Salt Cake** **Ammonium Carbonate**
Sulphuric Acid **Fluosilicates** **Insecticides and Fungicides**
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus

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Washington Report

By Fred Bailey & John Harms

Chemicals' farm market is to be big again in the new year . . . perhaps bigger than any year so far. This optimism shows up more and more as farmers begin to plan their 1955 production. Businessmen coming to Washington reflect the boomy feeling.

Generally, business this year is to be on the up-grade . . . contrasted to the downgrade of the past year or so. Government economists don't see anything like a sensational boom this year . . . just a "boomlet" which, however, may sow the seeds for genuine boomtimes in 1956 or 1957.

As a result of recent Agriculture department action . . . Corn Belt, one of the fastest growing fertilizer-use areas in the country, is to be stimulated toward more rapid use of plant food. Here's why:

The Agriculture Secretary: (1) Withdrew intentions to put the rugged "cross-compliance" feature of production controls into effect this year. Means that farmers this year will have as much freedom to produce what they want as they've had. Under this regulation, a farmer would have been penalized by loss of support on all crops if he over-planted restrictions on one. Only controls for this year now are on individual crops with no inter-crop restrictions.

(2) Dropped price support for oats, barley, rye and grain sorghums 15 per cent from this year's levels. This puts support for these grains about 20 per cent below the support level of corn, the major feed grain. This means that farmers will go in for considerably more corn this year, despite acre allotments, and also that more of the other feed grains will be grown to make up for lower support levels.

Note: The requirement that farmers must stick with individual crop production controls in order to receive Agricultural Conservation Program payments still stands.

Charges that potash produced in East Germany is being dumped on the domestic market will be investigated beginning Jan. 18 by the Tariff Commission at hearings here. This is an outgrowth of complaints filed by six major domestic potash companies who say the potash is sold at "less than fair value." If the commission finds that the imported potash threatens the domestic industry, it can recommend that barriers be raised to imports.

The new "Chemical and Rubber Industry Report" issued by the Business & Defense Services Administration is now available. Subscription rate is $1.75 per year . . . to Superintendent of Documents, Government Printing Office, Washington 25, D. C. First issue, in November, brings up to date the statistical gap since 1950 and contains information on about half the commodities to be covered. December issue completes the commodity list. The January issue deals with 1955 prospects.

The report says, for example, that new nitrogen plant completions are on the way to bringing capacity up to 3,125,000 tons by the middle of 1955, compared with the 1957 expansion goal of 3,500,000 tons. Also, the demand for phosphate fertilizer has not kept pace with the forecasts. Since 1950, production of triple superphosphate has increased 48 per cent, the report says.

The Administration's legislative program for this year is based on the assumption that we've got a firm foundation under the economy—now let's build, but slowly. Besides the expected tussle over foreign policy, these items are included as major planks in President Eisenhower's 1955 program:

(1) Continuation of the corporation tax rate at 52 per cent. This will take legislative action since the rate now is scheduled to drop to 47 per cent on April 1. Chances favor continuation. Scheduled excise tax reductions also are expected to be continued for such things as gasoline, cigarettes, whiskey, beer, automobiles and trucks. Official reason for continuing present rates: A $4.4 billion Federal budget deficit.

(2) Higher postal rates. Increases proposed are: First class mail, up from 3 cents to 4 cents; airmail, from 6 cents to 7 cents; and increases of 42 per cent in second class mail (magazines and newspapers) and 25 per cent for third class (circulars and advertising matter). Idea is to put the Post Office in the black.

(3) Reciprocal trade agreement law extension. This act, permitting the President considerable latitude in making tariff concessions, expires in June. Proposal is to extend it for three years and provide even more presidential authority under the law.

More Federal money for farm research and education is expected to result from a concerted drive by farm organizations to assure farmers sufficient know-how to produce for a much larger population 5–10 years from now. Farm organization leaders here are appalled at the job ahead for agriculture—despite present surpluses—believing current research isn't going to provide enough knowledge to increase production sufficient to meet needs.

A special farm organization research committee study of future farm needs has this to say about the problem: "The American farmer is in trouble . . . The existing methods of production and land-use practices, if not improved upon, will be inadequate to meet needs of our rapidly expanding population 10 years hence."

Specifically, the study recommends that Federal and state governments double their current expenditures for farm research and education by 1961. This year money available from these sources totals $247 million.

The committee study urges these increases by Congress for the fiscal year beginning next July 1: $11 million more for education (Extension Service), $8.5 million more in grants-in-aid to states for research and $9 million more for research done exclusively by the Agriculture department. Secretary Benson is understood to have gone at least part way along with these increases, although he's been over-ruled to a large extent by the Budget Bureau which does not see the need of such large increases.

Transportation may become one of the hotter issues debated in Congress this session . . . especially a move to ban the Agriculture department from representing farmers before the Interstate Commerce Commission on freight rate cases. The proposal reportedly has been made by a White House committee on transportation. Following a resolution demanding the move by the National Industrial Traffic League, several farm groups threatened to putt out of the "NIT" League. The league is a traffic group representing the nation's shippers.

Other recommendations made by the White House transportation group are said to include: (1) Top-to-bottom overhauling of the ICC, (2) removal of ICC authority to set maximum transportation rates . . . require, instead, that minimum rail, water, truck and air rates be set, (3) require that all contract carriers publish their rates in a move to encourage competition and discourage rate-cutting and rebates and (4) drastically curtail trip-leasing of trucks . . . a move general farm organizations and cooperative groups have been battling for years.

9 out of 10 growers who treat for soil insects use aldrin

aldrin formulations pay!

When rootworms and other soil pests hit the corn belt, it's a safe bet that growers will use aldrin. By killing rootworms quickly and easily, aldrin has won the position of No. 1 soil insect control.

Aldrin gets the other soil pests too! In addition to rootworms, aldrin gives the same outstanding control of wireworms, white grubs and others.

Since aldrin is compatible with most farm chemicals, it can be mixed readily with fertilizers. Many growers prefer to save labor by applying aldrin in an aldrin-fertilizer mix. Or, it can be applied as a row or broadcast spray. More and more growers will be using aldrin, so be sure you have adequate supplies.

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Was there an improvement in '54?

Pesticide Industry Report

Sales Up in Most Areas, Formulators Report. Price Cutting, Consignment and Other Problems Continue.

MATURITY. That seems to be one of the big answers to some of the major problems currently afflicting the pesticide industry. In a survey of a number of pesticide producers located in all sections of the country, FARM CHEMICALS found that many feel that some members of the industry must grow up before there will be a material improvement in situations such as unwarranted price cutting, freight allowances and other ills.

Increase in Sales

One encouraging note was the increase in pesticide sales reported by most organizations for 1954, although a number pointed out that the improvement was only in relation to a disastrous 1953 season and so constituted no outstanding gains.

A large number stated that price cutting was a deleterious factor in 1954 and that such activities adversely affected their business. The problem of "freight allowances" was considered a less important one, a situation that improved since the previous year.

Formulators were queried on their suggestions for possible solutions to current industry problems and, although few felt so strongly as Acme Fertilizer's Clark Bellamy who commented that the business has "become one without prestige," the greatest majority found much room for improvement.

Factors in 'Growing Up'

Growing up in the pesticide industry seems to involve a multitude of factors. Comments were received noting a number of underlying difficulties and suggesting various ways in which conditions might be alleviated. We will consider separately remarks on overproduction of basic materials, sales and promotion, fair trading, definitions and consignments as some of the basic principles involved.

One company stated flatly that "it is our opinion that only through hard-gained experience and loss of profit the members of our important industry will work toward the elimination of these problems presently afflicting our industry."

Roy E. Miller, Miller Products co., points out that the price-cutting situation is especially bad when newcomers enter the field, but that eventually they eliminate themselves or become educated to the fact that such activities are a temporary advantage at best.

R. C. Harnden, Chapman Chemical co., and W. H. Runge, Jr., Southeastern Farmers Supply co., concur in the opinion that the solution is an economic one in which those selling at low prices fall by the wayside.

A few more dry years, says Leon Cook, Southwest Chemical Supply, should convince the "chronic price-cutters that a legitimate margin is necessary to weather the bad years."

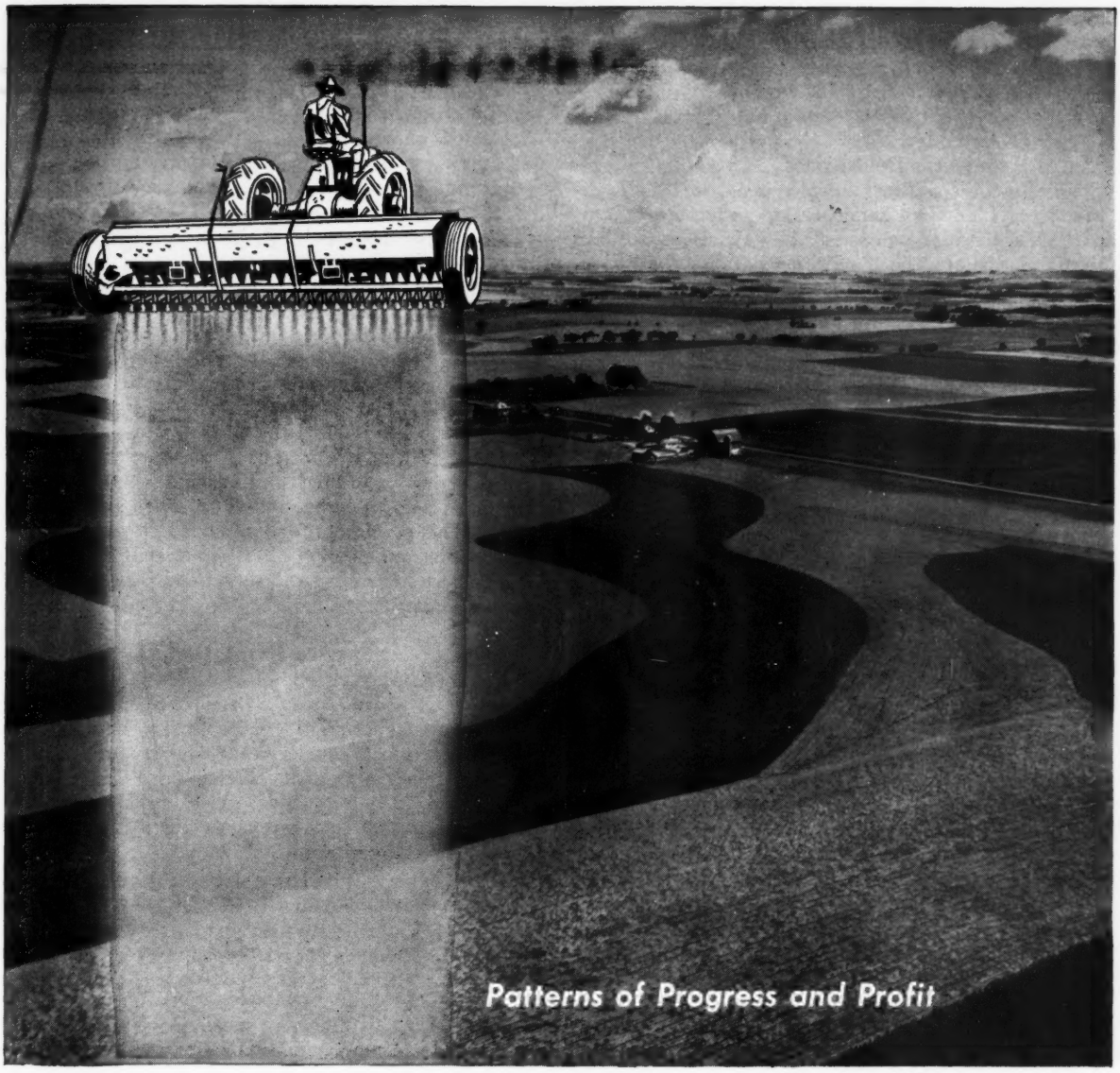
Similar remarks were received from other individuals and concerns who feel that a few hard knocks will either reform the troublemakers or force them out of business.

It is interesting to note that most of those who seem to have navigated the year in good shape stress that they operate on a one-price basis, striving to provide high quality goods backed by competent service and advice for their customers.

Many companies might well be envious of the position of Meeker-Hughes co. as expressed by J. Ross Hughes, who said that they "have a number of loyal customers who do not shop around for 'cut-price' materials. They would rather pay the full price and get first quality merchandise."

In fact, J. D. Rebstock, Florida Chemical Industries, feels that the customer will ultimately settle the price-cutting problem when he realizes that "his cheapest pesticides are quality products which effectively operate to save him crop losses."

The beneficial effects of a strong association were also cited in one instance by a company which pointed



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to the spirit of friendship and respect that have been fostered through a strong state organization.

What influences were considered of primary importance? Here is a partial list with appropriate comments as received from a group of industry leaders.

Definitions

What is a distributor, a dealer, a customer? J. B. Maddrey, Planters Chemical corp., suggests that a partial cure is the definition of these functions, adding that they "should be based on what use the buyer makes of the product" sold him and not on the size of the purchase.

Fair Trading

Proper definition of these functions leads naturally to the formulation of price schedules for each level of the marketing setup. Perhaps fair trade is too strong a term for what is desired, but it is most indicative of one possible solution.

With proper definitions, Maddrey continued, when complaint is made to a manufacturer that a dealer is underselling, the manufacturer can take steps to correct the situation making known the attitude of a dealer who insisted on continuing as a "disturbing influence."

Clark Bellamy comments in similar vein, stating that "no concern should sell to another concern or individual that habitually cuts prices. This should apply from the basic manufacturer right on through to the retailer."

One individual points out that some companies publish a price list but turn around and make a jobber out of a dealer if he demands a better price. Another practice is for a company to sell a dealer, then "go down the road" and sell market gardeners direct at the same dealer price.

It is hardly necessary to comment that such practices are of benefit to no one and only serve to create a situation in which it is difficult for any organization to sell effectively.

The idea of fair trading was seconded by an Eastern producer who says that a distributor, dealer and consumer price schedule set up by a manufacturer would work in the pesticide industry. He claims that distributor-consumer sales are the main cause of difficulty and that under such a setup distributors would not be supplied unless they held their price line.

A secondary benefit would be derived through the elimination of fly-by-night dealers who do not furnish service of any kind. Another who pointed out benefits of a strict price schedule was C. D. Bias, Tobacco States Chemical co. Better cost control methods would help, adds C. B. Brazeal, Hayes-Sammons co., coupled with management, not salesman set prices.

Consignments

W. R. Wood, Wood Chemical co., commented that the "practice of consigning materials has a demoralizing effect and creates heavy inventories." As Wood points out, a company gets through the season in good order, keeps its inventories to bare minimums, but then begins reaccepting materials at the end of the season. By the time it's all over the warehouse is bulging with inventory and, worse yet, the company is in a poor cash position which serves to further depress the market.

Other comments on the same subject included one by a Southern producer who feels that curtailment of consignments would help the overall situation, particularly if carried through to field strength materials.

"It is our firm belief," said a Southwestern company, "that consignment and agreements to pick up all carryover inventory at the end of season is the direct cause of the soft or weak price structure in the insecticide business." So far as this organization is concerned, it feels that the industry will continue to be plagued by price-cutting so long as the consignment situation exists, except when demand greatly exceeds supply. The multiplicity of field strength formulations was also cited as a prime factor in the inventory problem.

Over Production

The only way to control the underlying causes of price-cutting according to Samuel Marshall, Central Chemical corp., is through more sensible basic production. This sentiment was seconded by others who felt that output should be reduced to that required to meet a normal demand and that manufacturers should not attempt to anticipate high insect infestations.

Service-Promotion

James McConnon, The Mackwin co., feels that the industry as a whole would benefit if each company concentrated on promoting its particular advantages—its products, location, service, research, etc., making "price a minor part of its sales pitch." Have salesmen sell on a quality and service basis, McConnon comments, rather than relying on the excuse of price cutting by competitors when unable to garner a contract.

Another company reports that it strives to "give factual and constructive service to our customers" providing the highest quality materials possible coupled with well considered advice by a well trained sales staff. H. A. Woodbury, Woodbury Chemical co., also feels that proper marketing and sales procedures would tend to minimize the problem.

The need for research was cited by a company which attempts to "head the procession" through its research department in field testing new materials and through stressing the proper material, method and time of application.

L. A. Brown, Agsco Chemicals, Inc., points out the adverse effect that price cutting has on field research and assistance, one that in his opinion is resulting in a definite loss of progress.

These were the principal areas of thought as revealed by the FC questionnaire. Although there is admittedly nothing new in these possible approaches they do seem to warrant consideration.

Additional thoughts include the matter of companies producing both concentrates and field formulations, commented upon by R. E. Kincaid, Chemical Formulators, who feels that activities should be restricted to either selling raw materials to the formulator or to marketing the finished products.

The possibility of using a "seal of approval" type of standard such as those instituted by some other industries was also mentioned. Such a move, with ef-

fective promotion, could aid in discouraging the marketing of cut-price materials.

Much of the problem is an educational one, according to Paul Clute, Agricultural Products co., and he suggests that greater efforts be made to sell distributors and dealers on the fact that price cutting is not beneficial and "more often reduces profits than it increases sales."

This could be tied in with assistance to a competitor who reaches the point where he feels it necessary to sell below a reasonable level, says S. C. Smith, The Smith co. He adds that marginal products should be withdrawn from the market to avoid depressing sales of more profitable items, rather than reducing the price level.

One producer presented an excellent point when he cautioned against any joint efforts that might be misinterpreted by Government authorities. He noted as a reminder that in the past honest intentions have not been given credit by agencies engaged in antitrust activities.

Even though, in line with the above comments, concerted, industry wide review and action might prove deleterious, individual actions along some of the suggested lines might prove at least a partial solution.

It's obvious that there is no one answer to the problem; however, some of the ideas expressed seem to have definite merit and might well be given further consideration by responsible producers.

By utilizing one or more of these thoughts on a wider scale it may be possible to ease the growing pains and hasten maturity of the industry. As one man commented, "When the industry reaches maturity, the price-cutting problem will cease." ◆

Pesticide Safety Drive in Oregon

In response to a query from Farm Chemicals, J. D. Patterson, chief chemist of the Oregon Department of Agriculture, has provided a statement on a new Oregon state program for safe use of pesticides. Here are Patterson's comments in full:

FOLLOWING a highly publicized fatal TEPP poisoning case last spring, representatives of Oregon State College, the Oregon State Board of Health and the State Department of Agriculture met to consider means by which the public might be better informed on the safe handling of pesticides. Fields of action were defined. The college is working with county agents, home economic and other extension workers, as well as various trade groups meeting throughout the year on the campus. The State Board of Health is working with local and county health units, the medical societies, pest control operators, mixing plants and applicators. The Department of Agriculture, in addition to enforcement work, is contacting local feed and seed outlets as well as appearing before meetings of dealers.

Large posters warning of danger of pesticides are being distributed to grange halls, county agents' offices, health departments, and it is planned to eventually cover many retail outlets. These posters emphasize: 1. Store pesticides away from children; 2. Destroy empty containers; 3. Read the label; 4. Follow directions and 5. Use protective measures.

Liason Committee

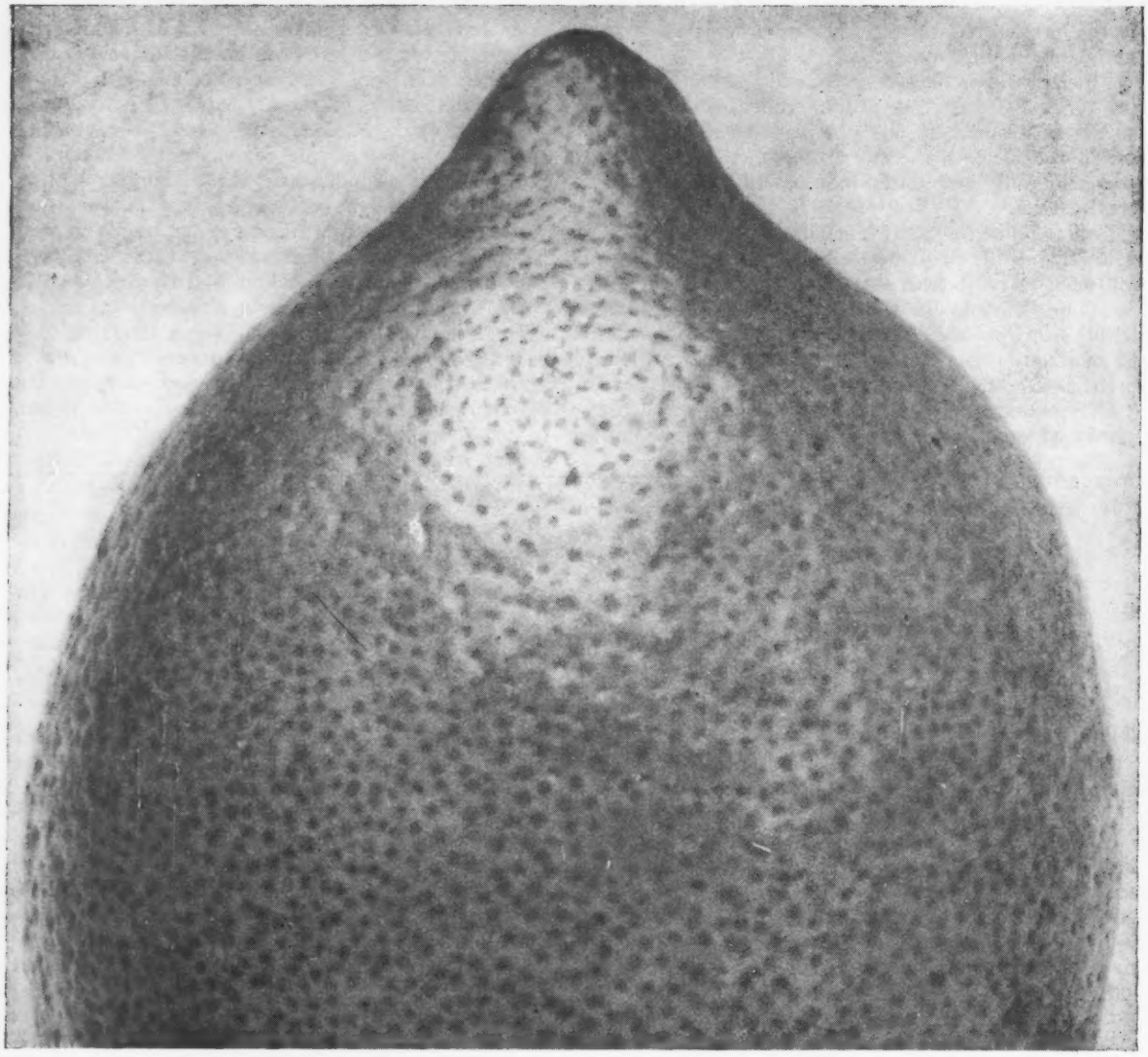
In order to coordinate this and other work, a liaison committee operates between the three organizations. This committee considers problems of toxicity, health hazards, labels, usage and registration. New products of unusual toxicity as well as some of the older products are being screened by this committee before registration is recommended. This is particularly true for products recommended for home or garden usage. It is felt that many of the newer products have a definite place in agriculture, but should not be used by the inexperienced or those unable or unlikely to take necessary protective measures recommended on labels of these materials.

Although the Department of Agriculture has full responsibility for registration of pesticides, the recommendations of this liaison committee are considered in accepting pesticide registration applications.

Emergency Treatment Directions

In studying submitted registration applications and labels, the committee has noticed a trend toward omitting directions for emergency treatment following misuse of a product, particularly the so-called "safe" pesticides. It is recognized that there may be a great difference in toxicity and that some pesticides may be used more safely than others. However, when a pesticide is misused or in other words an accident occurs, we believe directions for emergency treatment should be available not only for the highly toxic but also the so-called "safe" pesticides. Such directions should recognize the carrier or vehicle as well as the active ingredient. Poisoning from kerosene, for example, is not uncommon and when it occurs can be very serious.

Although careful screening of pesticide labels is one part of the program, the principal activity is that of continued education. In furtherance of this work it is hoped that the pesticide industry will lend its support. We believe a public informed not only of the value, but of the inherent hazards of pesticides is necessary if further criticisms or restraints are to be avoided. The pesticide industry through its contacts with the trade can be of great assistance. ◆



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What Rapid Tax Depreciation Means to You

by Willard F. Stanley
New York City

DO YOU fully realize the benefits you can derive from rapid depreciation under the new tax law? Are you familiar with the financial assistance it affords and the economic gain it can bring you?

For example, if you spend $100,000 to modernize your plant with machinery having a life of five years, you'll have about $10,000 more cash (10 per cent of cost) by the end of the first year to use toward paying for the new equipment. This financial assistance comes from reduced taxes because of rapid depreciation on the new property.

On the same amount invested in new property having a life of 20 years, your economic gain, from the free use of the taxes deferred to later years because of rapid depreciation, would exceed $8,000 (or 8 per cent of cost), assuming a reasonable cost for the money replaced by the deferred taxes.

The foregoing percentages of additional working capital and of economic gain hold good for any amounts of new property with these life spans.

Then there's the problem of how to handle the accounting for rapid depreciation—and the impact on earnings, dividends and market values, if your stock is traded.

This article tells you, in condensed form, not only your new tax rights as to rapid depreciation, but highlights of all other important factors you should consider in reaching a decision as to whether to adopt rapid depreciation and which rapid method will be the best for you.

The new Income Tax Code gives American industry the right to adopt for tax purposes, one of the new, rapid methods of depreciating new property acquired, constructed or reconditioned on and after Jan. 1, 1954. This right also applies to projects initiated prior to Jan. 1, 1954 to the extent of the cost of construction on or after said date.

Basic Methods of Tax Depreciation

The basic methods of tax depreciation under the new law are:

1. The Straight Line Method. This is the method customarily used in the past and consists of depreciating property in equal annual installments over its anticipated life expectancy. This method applies to *all* depreciable property, whenever acquired or constructed and of any life expectancy.

2. The Declining Balance Method. This method is not new, but hitherto was permitted only in special cases. The new law permits a write off of 200 per cent of the straight line rate annually, applied to the depreciated balance remaining at the end of each year.

For example, if a new property had an expected life of five years, the write off the first year would be 40 per cent of cost (instead of 20 per cent under the Straight Line Method); the next year the deduction would be 40 per cent of the balance of 60 per cent remaining undepreciated, or 24 per cent of cost; the following year the 40 per cent would apply to the 36 per cent of cost remaining undepreciated, which would make the deduction equal to 14.4 per cent of cost and so on.

This method may be used only with respect to new (not second hand) tangible, depreciable property acquired or constructed on and after Jan. 1, 1954, and having a life expectancy of three years or more.

3. The Sum of the Years Digits Method. This method, too, has been used occasionally in the past, but is now made available by the new law to all taxpayers with the same limitations as to the date of acquisition or construction and life of property as in the case of the Declining Balance Method.

The formula for computing deductions under this method is to add together each year in the expected life of the property (in the case of a four year life, this would be 4 plus 3, plus 2, plus 1, equals 10); and then divide this figure each year into the remaining years of life expectancy (including the current year); thus for the first year the calculation would be 10 divided

into 4, or 40 per cent of cost; the next year 10 would be divided into 3, making 30 per cent of cost, and so on.

4. Any other method selected by the taxpayer, provided the cumulative deductions at the end of any taxable year during the first two thirds of life expectancy of the new property shall not exceed the cumulative deductions under the Declining Balance Method. So, it is still possible to use special formulae, such as units of production, units of labor, etc., but taxpayer must be prepared to defend these special formulae as reasonable.

The new law does not permit taxpayers without consent of the Internal Revenue Service to switch from one method to another as to new property acquired or constructed in any year, except the right is expressly given in the law for taxpayers to change at the end of any taxable year from the Declining Balance Method to the Straight Line Method, as to the undepreciated balance (less salvage) then remaining.

The Declining Balance Method if carried forward unchanged would, theoretically, never fully depreciate the property, generally leaving an undepreciated balance from 3 to 13 per cent at the end of anticipated life, but taxpayer could deduct the unrealized salvage to the year of retirement.

Full depreciation can be obtained by switching to the Straight Line Method. The best time for the switch, in order to obtain maximum overall deductions, is at the end of the year following the half-way mark in the estimated life expectancy. Taxpayers must be prepared to defend the reasonableness of the Straight Line rates at the time the change is made.

The Declining Balance Method disregards the factor of salvage and thus may be more desirable for taxpayers with properties having a high salvage factor. By switching to the Straight Line Method taxpayers would inject the element of salvage into the depreciation allowance, since salvage must be considered in fixing depreciation rates under the Straight Line and Sum of the Digit Methods.

However, in all but exceptional cases, it is likely the best results will be obtained through adopting the Sum of the Digits Method or the Declining Balance Method, switching to Straight Line.

The Declining Balance Method will give taxpayers somewhat greater assistance in financing expansion or modernization because the deductions thereunder are higher in the first two years of life of the property, On the other hand, the Sum of the Digits Method will, where the life expectancy of the property is about seven years or more, give a larger economic gain.

Willard F. Stanley has had over 30 years' experience in corporate matters and is presently the head of Corporate Services, Inc., New York consultants. He is a member of the Controllers Institute of America, the New York Society of Security Analysts, National Committees on Federal Taxation and on Social Security, the Controllers Institute and the Finance and Management committee of the latter organization.

Stanley is presently specializing in assisting corporate management to analyze factors affecting their decision to adopt rapid depreciation.

Who is Affected?

Individuals, partnerships, corporations and all other forms of taxable entities, acquiring or constructing new, tangible, depreciable property on and after Jan. 1, 1954 may avail themselves of any of the rapid methods permitted by the new law.

What are the Elections?

The test as to adoption of rapid depreciation and changes in methods adopted applies to each year's acquisitions. If taxpayers fail to adopt rapid depreciation as to particular property acquired in any year, they cannot do so in any subsequent year as to that property. But taxpayers can elect rapid depreciation as to the same type of property acquired in any subsequent year.

Similarly, if taxpayers elect a rapid depreciation method they cannot change in any subsequent year to any other method as to such property (except from Declining Balance to Straight Line), but they are free to adopt a different method as to similar property acquired in any subsequent year.

Different methods may be adopted for different classes or items of property acquired in the same year, or one rapid method may be applied to all such property on a composite basis. As to each year's acquisitions, elections must be made in the tax returns for that year.

Are Depreciation Rates Affected?

The rapid methods of depreciation which the new law permits should not affect depreciation rates or life expectancy of property. These rates should be the same for the new property as to which rapid depreciation is adopted as for similar property which taxpayer owned prior to Jan. 1, 1954.

Rates could be altered, however, where there are changes in conditions, or location of property or excess of accumulated reserves, etc. But in such cases the change would no doubt have been required regardless of the adoption of rapid depreciation.

Fears have been expressed that the benefits of higher depreciation allowances under the rapid methods applied to new property might be offset by lower depreciation allowances for tax purposes with respect

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to older properties. The language of the statute and the expressed intentions of Congress both seem to make such fears groundless.

Financial Assistance

The primary benefit of rapid depreciation is that by increasing depreciation deductions for tax purposes in the early years of the life of the new property involved, it defers to later years the payment of substantial amounts of taxes which otherwise would be payable in such early years under the Straight Line Method.

The financial assistance taxpayers will obtain by reason of the additional cash working capital available to them as a result of the deferred taxes, will be helpful in all cases where rapid depreciation is adopted, but should be of the greatest importance where the new property has a relatively short life and represents a substantial degree of expansion.

Table 1 shows the respective amounts of financial assistance derivable during the first year of life of new property from the adoption of rapid depreciation, using the Declining Balance Method.

Table 1
Life Expectancy of New Property

(assumes 50% tax rate)

	5 yrs.	10 yrs.	20 yrs.	33 yrs.
Per cent of Cost of New Property Represented by Additional Cash Working Capital from Deferred Taxes*	10%	5%	2½%	1½%

*These percentages are applicable to any amounts of new property.

The Declining Balance Method always provides the largest tax deferral in the first two years, and is accordingly the preferable method in cases where financial assistance is of primary importance to the taxpayer. This financial assistance is the fundamental purpose of the new provisions as stated in the Congressional Committees' reports.

Without the benefit of such tax deferrals taxpayers would have to provide equal amounts either through internal funds (such as depreciation accruals or retained earnings) or by bank loans or the sale of debt or equity securities. The source of such funds will vary.

Where the relation of new to old property is comparatively small, depreciation funds may be sufficient. Where the ratio of new property is large, sale of new securities or bank loans may be necessary, with accompanying financial problems and higher money costs. It is in these latter cases that rapid depreciation will be of maximum help.

The financial help supplied by rapid depreciation may be of particular importance where a modernization program is being considered and availability of cash from deferred taxes may be crucial.

Economic Gains

Another, and totally different, benefit from rapid depreciation, of more universal application, since it affects all taxpayers in varying degrees, is the economic gain by reason of the free use of the deferred taxes during the period of such deferral.

What are the Objections?

The following are the principal objections to the adoption of rapid depreciation:

1. The fear of lower depreciation rates being applied to older properties has already been mentioned and dismissed.

2. The adoption of rapid methods will require keeping two sets of property records for tax purposes. Each year's additions should be segregated. In some cases it may not be practicable to apply rapid depreciation to small property items because of the clerical work involved. Where the amounts of new property are reasonably large in dollars, however, the benefits should far outweigh the trouble and expense.

3. It is sometimes urged the annual rate of tax depreciation is not too important, since the taxpayer can write off only 100 per cent of cost and any acceleration merely "defers" and does not "save" taxes. This view overlooks the substantial benefits inherent in the financial assistance and/or economic gains from the free use of the deferred taxes, and is, therefore, unworthy of serious consideration.

4. Most important of all probable objections is, perhaps, the fear that higher tax rates in later years, when depreciation deductions will be lower if a rapid method is used, will more than offset the benefits. Accurate prediction of future tax rates is not feasible, but income tax history indicates that over long periods an upward trend in tax rates is the rule.

While this possibility of loss through higher tax rates deserves serious consideration, fear that such higher rates are likely to offset the economic gains (based on average after tax money costs) seems unfounded in the case of most taxpayers.

5. Higher future money costs in years of lower depreciation, when the deferred taxes are to be paid, constitute another possible danger. This could arise either from an increase in rates for certain classes of securities or from having to raise the funds to pay the taxes from a source which carried a higher money cost. These money costs are spread over all the years of life expectancy of the property.

Moderate expansion in early years might be followed by more rapid expansion, requiring sale of equity securities at higher money costs. Relatively con-

tinuous expansion would greatly minimize loss from high money costs by overlapping the periods. Like the bugaboo of higher future tax rates, fear of loss through higher money costs appears generally unwarranted.

Accounting Treatment and Its Impact

Rapid depreciation differs drastically from accelerated amortization of emergency facilities. Rapid depreciation is designed to stimulate permanently business expansion and modernization, the "normal" rate of tax depreciation being intentionally accelerated without any anticipated diminishing of normal life expectancy of the new property or more rapid actual deterioration in early years. It affects all taxpayers building or buying new depreciable property and will involve tremendous and annually increasing amounts as expansion continues.

On the other hand, accelerated amortization was a temporary expedient to meet a specific defense effort, applying to relatively few taxpayers, allowing a purely arbitrary rate of write-off which recognized unusually rapid deterioration (economically or physically) of the certified facilities constructed for the defense effort.

Under these circumstances accounting treatment employed to reflect accelerated amortization does not seem applicable to rapid depreciation. There seems to be no justification for deducting depreciation on the taxpayers' books at the rapid rate used for tax purposes, a practice followed by most industrial and commercial corporations with respect to accelerated amortization.

Taxpayer corporations whose stock is listed or quoted in the security markets should consider most seriously the impact of the accounting treatment they adopt upon their earnings, dividends and the market value of their common stock. Where the life of the new property is long, or where the expansion is continuous, the aggregate tax reductions will be recurring.

If a taxpayer (such as a utility) made the same amount of additions each year, with the same average life expectancy, net tax depreciation deductions under the "Digit Method" would *never* be less in any year than under the straight line method, and, if there were *any* increase in the amount of the additions, year over year, such aggregate annual rapid depreciation deductions would *always* be more than under straight line depreciation.

If depreciation on new property subject to rapid depreciation is deducted on the books at the rapid rate used for tax purposes, earnings will inevitably be reduced and market values adversely affected. Such adverse effect could be tremendous in scope and *more than outweigh the financial and economic advantages of rapid depreciation.* This is not an argument against adopting rapid depreciation, but an argument against this accounting treatment, which seems unwarranted unless there is reason to believe that the new property will actually deteriorate more rapidly than it did in the past.

The justification for a charge to income to "equalize" it by offsetting the year's tax reductions, depends somewhat upon the degree of "recurrence" of the annual tax reduction and its materiality in relation to total income. Such a provision may be desirable to prevent material distortion of annual income as compared with later years. But where the tax reduction is recurring or immaterial it seems preferable to let the tax reduction from rapid depreciation flow through to increase income and earned surplus.

When is Rapid Depreciation Inadvisable?

To make rapid depreciation inadvisable requires an unusual combination of circumstances.

First, it must be assumed (1) the life of the new property is short, say five years, thus reducing economic gains, and (2) the ratio of new property to total assets is small, say 5 per cent, with the taxpayer having substantial excess cash working capital, thus eliminating need for financial assistance. But to suffer a net loss from adopting rapid depreciation, further assumptions are necessary.

For instance, with five year life property, taxpayer must believe tax rates will rise considerably about two years later and continue at the high rates for at least three years, or must contemplate substantially higher expansion some two years off, materially increasing the cost of money used to pay the deferred taxes in later years.

These are only a few of many combinations that could result in an unfavorable overall result from adopting rapid depreciation. But such instances should be greatly in the minority.

To Summarize . . .

Almost all taxpayers eligible for rapid depreciation should gain by adopting it. With high expansion of short lived property, the financial help will be considerable, and may sometimes be decisive.

With longer life, economic gains will be paramount and prove of material benefit. Most of the benefit of financial assistance can be quickly realized. Economic gains, while more tangible, are harder to predict with accuracy, since they may often accrue over extended periods, when unpredictable factors may affect the outcome. But while economic gain cannot be guaranteed, it is a strong probability in most cases.

It is not feasible to present here detailed discussion of many important aspects of this subject or to include many formulae, tables and charts pertaining thereto. These will be contained in a new book by the author, entitled *New Rapid Tax Depreciation—What It Means to You* (of which this article is a condensation), which will shortly be published by Prentice-Hall, Inc. ◆

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Z. H. Beers (center), MWSIC, with Marshall Smith and W. Farley, Smith Agricultural Chemical co

Z. H. Beers Describes Expanded '55 Activites

Vorhes Heads MWSIC

H. S. VORHES, Virginia-Carolina Chem. corp. was re-elected president of the Middle West Soil Improvement Committee at its annual meeting on Nov. 4 at the LaSalle Hotel, Chicago. Other officers for 1954–55 include W. M. Newman, Price Chemical co., re-elected vice president and R. G. Fitzgerald, Smith-Douglass co., treasurer.

Attendance passed the 200 mark and included representatives of MWSIC's 63 active and associate members.

Z. H. Beers, executive secretary, cited results of the committee's 1954 educational program and reported on other activities including fertilizer research projects the committee helps sponsor at nine Midwestern colleges.

Plan Expanded Activities

With addition of Charles E. Trunkey to the MWSIC staff, said Beers, expanded activities will be launched this year. Included in the program is development of TV material; preparation of color folders on building crop yields and profits through fertilizer usage; release of color film strips to agricultural leaders and farm groups and increased contact with agronomists in gathering and processing material for educational use.

Directors re-elected for three year terms included Kirk Wagenseller, Swift & co., and W. M. Newman. New directors are Dan Williams, Farm Bureau Service co. (Minn.), and George Kingsbury, Kingsbury & co. ◆

Cash Cahill, Rath Packing co.; T. Roffers, N.W. Coop. Mills and L. Peterson, Midland Cooperatives, Inc.

H. L. Garrard, American Potash Institute, and D. T. Friday, Nitrogen div.

R. A. Garn, Farm Bureau Coop. Assn., with C. F. Martin, Miami Fert. co.

J. R. Sargent, Federal Chemical co., and A. J. Darfus, Virginia-Carolina.

New Products 1954

A review of materials marketed during 1954

HERE IS the second annual FARM CHEMICALS round-up of new products introduced or marketed to the farm chemicals industry during the past year. All major suppliers of basic chemicals for fertilizer and pesticide producers were contacted in order to provide, as completely as possible, a guide to 1954 introductions.

In addition to new product listings, you will find some information on well known pesticides which have received acceptance for additional uses during the year.

For your convenience in contacting the manufacturers, an alphabetical listing of names and addresses follows the product section.

The data have been supplemented in some cases with information compiled from material received during the year. Some companies did not respond to the inquiry and we were unable to obtain information on their products from other sources.

Adjuvants

DEACTIVATOR-H. Velsicol corp.
Description: A deactivating agent designed to prevent decomposition of an insecticide by its carrier. Developed for use with heptachlor dust and granulated formulations.

IMPROVED NO. 150 XYLENE-TYPE SOLVENT. Crowley Tar Products co.
Description: A coal tar derivative with low phytotoxicity, low weight per gallon and high solvency powder. It emulsifies well and requires only a non-red label. **Uses:** Has been used as a solvent for DDT, malathion, 2 lb. BHC and other pesticide emulsions. **Availability:** Immediate shipments during peak season.

NATIONAL STICKER. Olin Mathieson Chem. corp.
Description: A resinous adhesive agent developed to increase deposit and useful life of pesticide sprays. **Availability:** Experimental quantities.

ZEOLEX 7. J. M. Huber corp.
Description: Carrier for pesticide bases and wettable powders. In combination with other less sorptive carriers, it provides a range of sorptive capacity to meet requirements of various pesticides and concentrates.

Emulsifiers

AGRIMUL T (Improved). Nopco Chemical co.
Chemical Nature: Anionic-nonionic blend. **Description:** Designed chiefly for use in formulating emulsifiable toxaphene concentrates. Gives excellent spontaneity and very good stability in all waters.

AGRIMUL TK-1 & TK-2. Nopco Chemical co.
Chemical Nature: Anionic-nonionic blend. **Description:** Recommended for ester weed and brush killer formulations. Gives good stability in all waters and is soluble in diesel oil and kerosene.

ATLOX A-52. Atlas Powder co.
Chemical Nature: Sorbitan mono fatty acid ester. **Description:** An emulsifying assistant for use with Atlox 3335 (see below) and generally useful with a wide variety of insecticides and herbicides. **Availability:** Commercial.

ATLOX 1186. Atlas Powder co.
Chemical Name: Polyoxyethylene sorbitol hexaoleate. **Description:** An emulsifying assistant for use with Atlox 3396 (see below) in herbicide formulations. **Availability:** Commercial.

ATLOX 3335. Atlas Powder co.
Chemical Nature: Alkyl aryl sulfonate blended with polyoxyethylene sorbitan esters of mixed fatty and resin acids. **Description:** A general purpose emulsifier for insecticides and herbicides. **Availability:** Commercial

ATLOX 3396. Atlas Powder co.
Chemical Nature: Alkyl aryl sulfonate blended with polyoxyethylene sorbitol hexaoleate. **Description:** A general purpose emulsifier for insecticides and herbicides. **Availability:** Commercial.

EMCOL EMULSIFIERS. The Emulsol corp.
Chemical Nature: Blend of polyoxyethylene ethers and oil soluble sulfonates. **Names and Descriptions:**
EMCOL H-83T. Toxaphene and chlordane emulsifier.
EMCOL H-84T. Toxaphene and chlordane emulsifier.
EMCOL H-85T. DDT, BHC, dieldrin and DDT emulsifier.
EMCOL H-140. Malathion and parathion emulsifier.
EMCOL H-141. Malathion and parathion emulsifier.
EMCOL H-400. Aldrin, heptachlor, BHC, lindane, 2,4-D and 2,4,5-T ester emulsifier.
EMCOL H-500. Aldrin, heptachlor, BHC, lindane, 2,4-D and 2,4,5-T ester emulsifier.
EMCOL H-600. Herbicide ester emulsifier.

NONIC 300. Sharples Chemicals, Inc.
Chemical Nature: Polyethylene glycol alkylphenyl ether nonionic surface active agent. **Description:** A wetting agent, detergent and emulsifying agent for agricultural sprays.

TOXIMUL 500. Ninol Laboratories.
Chemical Nature: A special blend of anionics and nonionics. **Description:** For emulsions of toxaphene, DDT, BHC, aldrin, etc. with only three per cent emulsifier. **Availability:** Commercial.

TOXIMUL MP. Ninol Laboratories.
Description: An emulsifier designed specifically for use with malathion, imparting exceptional spontaneity and emulsion stability. **Availability:** Commercial.

Fertilizer

AGREA. Grace Chemical co.
Description: A 45 per cent nitrogen urea fertilizer compound. The readily soluble, prilled material is coated with a mineral conditioning agent.

AMNICAL. Ashcraft Wilkinson co.
Description: Italian made ammonium nitrate limestone containing 20.5 per cent nitrogen and about 40 per cent calcium carbonate with magnesium carbonate.

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55 New Montgomery St., San Francisco 5, California

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PHOSPHATE. Wilson & Geo. Meyer & Co., Intermountain.
Description: High analysis (46% APA) granular material produced by the Garfield plant of Western Phosphates, Inc. and distributed by the Meyer organization.

ARCADIAN UREA 45. Nitrogen division.
Description: A pelleted 45 per cent nitrogen urea fertilizer. **Uses:** For direct application with field or airplane equipment and for use with irrigation waters and in foliage sprays. **Availability:** Commercial production at Omaha, Neb.

COLEMANITE HIGH-GRADE. Pacific Coast Borax co.
Description: A low price borate containing 32.6 per cent boric oxide and 33.8 per cent calcium oxide for preventing and correcting boron deficiencies. **Uses:** Features slow solubility and is well adapted for crops on light and porous soils and in areas of high rainfall. Can be used to borate fertilizers for application at more than normal rates on cotton and boron sensitive crops.

DAVISON TRIPLESUPERPHOSPHATE. Davison Chem. co.
The company's Bartow, Fla. plant for triple super went into production this year. This is the first time Davison has made the material.

DAVISON 12-12-12. Davison Chem. co.
New addition to Davison's mixed fertilizer line and produced as a conventional ground product, granulated. **Availability:** Through company plants in any market area.

FERRALKINE LS. Glyco Products co.
Chemical Nature: 10 per cent aqueous solution of iron tetrine, the iron salt of ethylenediamine tetracetic acid. **Uses:** Initial tests indicate that the material is stabilized to *p*H conditions high as 8.5 and thus may prove beneficial in curing iron deficiencies in alkaline soils. **Availability:** Commercial.

FERRALKINE GC. Glyco Products co.
Chemical Nature: The iron complex of a derivative of ethylenediamine tetracetic acid (sodium salt) which has been adsorbed onto vermiculite for convenience in handling and application. **Uses:** To supply trace amounts of iron to plants grown in iron deficient soils. **Availability:** Commercial.

FERTILIZER SPRAY CONCENTRATE. Olin Mathieson Chem. corp.
Description: A 21–15–7 soluble plant food for lawns and pastures. **Availability:** Commercial.

GOLDEN VIGORO COMPLETE LAWN FOOD. Swift & co.
Termed a new concept in plant food formulation, it will not burn growing grass (at recommended rates) and has nitrogen from sources providing availability over a period of months. Two patents granted and others pending on formulation and manufacturing methods.

INTERNATIONAL MIN. & CHEM. TRIPLE SUPERPHOSPHATE. International Minerals & Chem. corp.
Description: A finely ground product primarily designed for mixing, ammoniation and granulation with bulk density of about 57 pcf and a minimum of 46 per cent APA. **Availability:** Commercial for prompt shipment, sold in bulk only.

IRON TETRINE 6V. Glyco Products co.
Chemical Nature: Iron tetrine adsorbed on vermiculite. **Uses:** To supply trace amounts of iron to plants in iron deficient soils and designed to minimize chances of fruit burn in treatment of citrus. **Availability:** Commercial.

LAWN & GARDEN CYANAMID. American Cyanamid co.
A granular product in 10, 25 and 50 lb. bags, the first small package offering of cyanamid.

MULTI-SUPER. International Min. & Chem. corp.
Chemical Nature: A high analysis (guaranteed minimum 50 per cent APA) pelleted P_2O_5 material. **Uses:** For direct application with any type of equipment. **Availability:** Commercial, in bags or bulk. Tonnage limited at present time.

NU-IRON. Tennessee corp.
Chemical Nature: Nutritional iron compound. **Uses:** For use in dust or spray application for correction of iron chlorosis on all types of plants. **Distribution:** Expected to be primarily to formulators for use in nutritional mixtures.

NU-MANESE. Tennessee corp.
Chemical Nature: A manganous oxide. **Uses:** As a source of manganese in fertilizer or for direct application where larger amounts are required. **Availability:** Commercial.

NULLAPON NaFe-13. Antara Chemicals.
Chemical name: Technical sodium ferric ethylenediamine tetracetate. **Uses:** To correct iron deficiency (chlorosis) in field and ornamental crops. A highly concentrated iron chelate especially designed for application in fertilizer mixtures or in other diluted forms for citrus and vegetable crops. **Availability:** Commercial.

PHILLIPS 66 AQUA AMMONIA. Phillips Chemical co.
Chemical Nature: Ammonium Hydroxide (NH_4OH). An aqueous solution containing 20.5 per cent nitrogen. **Uses:** For direct application or with irrigation waters. **Availability:** Commercial.

PHILLIPS TRIPLE SUPERPHOSPHATE. Phillips Chemical co.
Description: Concentrated 46 per cent APA material for use in formulation of high analysis mixed goods and for direct application. **Availability:** Commercial.

SOLUBLE VERSEN-OL CONCENTRATE. Versenes, Inc.
Chemical Nature: Iron chelate known as NaFeEEDTA. **Description:** Available in three forms: one pound tin; adsorbed on vermiculite for direct application or in mixed goods; and in a pure concentrate for mixing.

VITREA. Grand River Chem. div.
Description: High analysis (45 per cent N), prilled urea fertilizer that has been specially conditioned. Available in 80 pound bags for application by any method.

ZEBRA BRAND 20-20-0. New York Hanseatic corp.
Chemical Name: Ammonium Phosphate Nitrate. **Description:** Pelleted, free flowing material manufactured by Farbwerke Hoechst A. G., Germany and distributed by the above company affiliated with Carnegie Chem. Mfg. corp., Los Angeles and Karl D. Schwartz co., San Francisco. **Availability:** Commercial in Calif. and Ariz.

Fumigant

N-869 SOIL FUMIGANT & FUNGICIDE. Stauffer Chem. co.
Chemical Name: Sodium N-methyl dithiocarbamate dihydrate. **Uses:** Soil fumigant displaying excellent toxicity towards nematodes, soil insects, weed seeds and fungi. Water solubility permits application through irrigation or spray systems and, with recommended application methods, no ground coverings are required. Has given excellent results in seed beds for tobacco, vegetables and nursery products and casing soils for mushroom houses. Anticipated that use will extend to general soil sterilization for crop lands and reclamation of heavily diseased areas. Also shows promise for pre-planting treatment of lawns and renovation of turf areas. **Availability:** For experimental work and for limited sales under experimental registration. Commercial availability anticipated in 1956.

Fungicides

ACTI-DIONE FERRATED. The Upjohn co.
Chemical Nature: Cycloheximide and ferrous sulfate. **Description:** Antibiotic fungicide effective for control of leaf spot on cherry and turf diseases such as dollar spot, brown patch, snow mold and the melting out (Helminthosporium) disease. Marketed in package containing nine gram vial of Acti-dione and an eight ounce bottle of ferrous sulfate.

ACTISPRAY. Niagara Chemical div.
Description: Antibiotic plant fungicide based on Acti-dione. Provides protection for sour cherry trees against the cherry leaf spore. Packaged in glass tubes as soluble tablets.

HEXACHLOROBENZENE. Olin Mathieson Chem. corp.
Description: A non-mercurial seed protectant for the control of common bunt on small grains. **Availability:** Commercial.

LIQUID 365 and 244. E. I. DuPont deNemours & co.
Description: Seed disinfectants based on a combination of phenyl mercury acetate and ethyl mercury acetate for use

on small grains. The first, 365 is a concentrate for dilution with water and use in slurry treaters while 244 is for use undiluted in ready-mix treaters. **Availability:** Both are sold in five and 30 gallon drums; 244 is also available in 50 gallon drums.

OMAZENE. Olin Mathieson Chem. corp.
Chemical Name: Copper dihydraxinium sulfate. **Uses:** For the control of powdery mildew and black spot on roses, for experimental uses in control of early and late blights and powdery mildew on certain vegetable and field crops.: **Availability:** Commercial for powdery mildew control on roses.

PHYTOMYCIN. Olin Mathieson Chem. corp.
Chemical Nature: 20 per cent streptomycin nitrate solution. **Uses:** For control of fireblight of apples and pears and bacterial leaf spot of tomato and pepper. **Availability:** Commercial.

PURASEED. Gallowhur Chem. corp.
Chemical Nature: Organic mercury cadmium compound. **Uses:** As a seed disinfectant on wheat, oats, flax, etc. in dust or slurry form. **Availability:** Commercial.

TERRACHLOR. Olin Mathieson Chem. corp.
Chemical Name: Pentachloronitrobenzene. **Uses:** For prevention of seedling damping-off caused by certain soil fungi, control of potato scab, clubroot and black root of cabbage, crown rot of clover, dwarf bunt of wheat, southern blight, crown and black rot of bulbous crops. **Availability:** Experimental purposes, in commercial quantities for certain applications.

Herbicides

ALANAP-1. Naugatuck Chem. div.
Chemical Nature: Contains 90 per cent N-1 naphthyl phthalamic acid. **Description:** A selective herbicide now available for use on asparagus as well as certain cucurbits for control of pigweed, purslane, lambsquarter, quickweed, ragweed, chickweed, foxtail and crab grass. **Availability:** Limited quantities.

ALANAP-3. Naugatuck Chem. div.
Chemical Name: Sodium N-1 naphthyl phthalamate. **Uses:** A selective preemergence herbicide for control of pigweed, purslane, lambsquarter, ragweed, chickweed, foxtail, crabgrass, velvetleaf, cocklebur and bindweed in soybeans. Potential uses are for pre-emergence weed control in some cotton areas as well as for a lay-by spray in Southwestern cotton. **Availability:** Experimental material, hope for registration prior to 1955 season.

CHLORO-IPC. Columbia Southern Chem. corp.
Has received USDA approval for use as a pre-emergence herbicide for onions and lettuce.

CRAG HERBICIDE-1. Carbide & Carbon Chem. co.
Chemical Name: Sodium 2(2,4-Dichlorophenoxy) ethyl sulfate. **New Uses:** As a pre-emergence herbicide on peanuts applied in bands about 14 inches wide at 3 pounds per acre at time of planting. It prevents weeds by killing the germinating seed and can be safely used on deep-seeded crops or established plants. Has no drift hazard. Also used to control crabgrass in established lawns applied at three to four week intervals during the crabgrass season without hazard to established lawns. **Availability:** Commercial.

HCA WEEDKILLER. General Chemical div.
Chemical Name: Hexachloroacetone. **Uses:** Experiments have shown that it gives good results in controlling Johnson grass in cotton areas. Tests are being conducted to determine the value of the material in combatting nut grass and in clearing ditch banks. **Availability:** Experimental quantities only.

KARMEX-DL. E. I. DuPont deNemours & co.
Description: A substituted urea herbicide introduced in 1954 for commercial use in a few cotton growing areas.

KARMEX-W. E. I. DuPont deNemours & co.
Description: A substituted urea herbicide recommended for selective weed control in asparagus, sugar cane and pineapple. Also for control of weeds in ditches and canals.

SILVEX. Dow Chemical co.
Chemical Name: 2,4,5-Trichlorophenoxypropionic acid. **Uses:** Shows promise in weed and brush control with greatly reduced hazard in cotton growing areas. Useful formulations include water sprays of amine salts and esters.

2,4-D BEP ESTER. Monsanto Chemical co.
Chemical Name: Butoxyethoxypropyl ester of 2,4-D acid. **Description:** Low volatile herbicide for weed and brush control. **Availability:** Commercial.

2,4,5-T BEP ESTER. Monsanto Chemical co.
Chemical Name: Butoxyethoxypropyl ester of 2,4,5-T acid. **Description:** Low volatile herbicide for weed and brush control. **Availability:** Commercial.

Insecticides

ALDRIN. Shell Chemical co.
USDA approved as a seed treatment alone or in combination with fungicides as a dust or wettable powder.

CHLOROBENZILATE. Geigy Agr. Chem.
Miticide approved for use on apples.

CHLORTHION. (Bayer 22/190). Chemagro corp.
Chemical Name: O,O-dimethyl-0-3-chloro-4-nitrophenyl thiophosphate. **Description:** Developed by Dr. Gerhard Schrader of Farbenfabriken Bayer A.G., Germany. Has relatively low toxicity to mammals and appears to control practically all insects controllable by parathion. In addition it appears to offer effective control of the boll weevil and related species. **Availability:** Experimental use only. **For testing:** 25 per cent wettable powder, spray concentrate, 3 per cent dust, 3 per cent dust plus 5 per cent DDT and in technical form (for special purposes). Was available last season in limited quantities for mosquito control.

CYCLETHRIN. Carbide & Carbon Chem. co.
Chemical Name: 3-(2-cyclopentenyl) 2-methyl-4-0-0-2-cyclopentenyl chrysanthemum-monocarboxylate. **Description:** More highly synthesized than allethrin by pyrethrins synergists for rapid knock down and kill of houseflies in oil space sprays and low pressure aerosols. **Uses:** Shows promise for control of biting flies on dairy cows in oil space-repellent mixtures in water based sprays and in treadle sprayer concentrates.

DIAZINON. Geigy Agr. Chem.
Given USDA approval and available for use as a 25 per cent wettable powder and 1 per cent bait. Two formulations, a 25 per cent emulsifiable concentrate and a 4 per cent dust are under test. Intended for use in non-dairy barns, sheds and poultry houses, not on animals or in dairy barns, food processing plants or human dwellings. Controls chlorinated hydrocarbon resistant houseflies.

DIELDRIN. Shell Chemical corp.
Approved for household pests to be used in three forms: 1 per cent dust, 0.5 per cent solution and an emulsifiable concentrate with 1.5 lbs. dieldrin per gallon for dilution as directed. For roaches, ants, ticks, silver fish, mud daubers, paper nest wasps and carpet beetles.

DIPTEREX-119. Pittsburgh Coke & Chem. co.
Chemical Nature: Contains L 13/59, O,O-dimethyl-1-hydroxy-2,2,2-trichloroethylphosphonate. **Uses:** Highly effective for control of houseflies (including chlorinated hydrocarbon resistant strains) when used as a dry bait, liquid bait or varnish. Granted Federal registration for use in and around farm buildings and in areas outside the home. **Availability:** Commercial.

ENDRIN. Shell Chemical corp.
Received label acceptance by USDA for use on tobacco hornworms, tobacco budworms, fleahoppers and grasshoppers. Introduced last year as a cotton insecticide, it may also be adaptable for other crops.

FLY FLAKES. John Powell-Florida Agr. Supply co.
Description: Fly killer in flake form available in 25 lb. drums, 5 and 10 lb. bags. Produced by FASCO and sold by both organizations.

META-SYSTOX. (Bayer 21/116). Chemagro corp.
Chemical Name: O,O-dimethyl 0-2-ethylmercaptoethyl thiophosphate. **Description:** The methyl analogue of Systox, developed by Dr. Gerhard Schra-

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der of Farbenfabriken Bayer A.G., Germany. A systemic which appears to penetrate rapidly and to translocate upward within the plant. It renders the plant toxic to many pests, especially sucking insects, for considerable periods of time and does not appear harmful to insect predators. **Availability:** Experimental only in a water miscible spray concentrate containing 4 lbs. active ingredient per gallon.

PENCO HIGH GAMMA BHC. Pennsylvania Salt Mfg. Co. of Wash.

New plant at Calvert City, Ky. on stream during 1954 includes production of 46 per cent high gamma technical BHC and 14 per cent gamma BHC in flake form for grinding and extending into dust base or finished cotton dusts.

PRENTOX PYRONYL. Prentiss Drug & Chem. co.

Description: Termed the first offering, on an economical basis, of a high concentrate of synergized pyrethrum. In dust concentrate form.

STROBANE. B. F. Goodrich Chem. co. **Chemical Nature:** Terpene Polychlorinate (66% chlorine). **Description:** Registered for space sprays, aerosol sprays and moth-proofing pressurized sprays. It is being investigated for use against mosquitoes and other disease vectors and shows promise against insects infesting livestock, fruits, vegetables, forage and field crops. **Availability:** Commercial for approved applications, experimental for investigation work.

SYSTOX. Pittsburgh Coke & Chem. co.

Approved for use on apples for control of aphids and mites and accepted for use on potatoes at ¾ pint per acre to combat potato aphid and leafhopper.

Miscellaneous

DURASET-20W. Naugatuck Chem. div. **Chemical Nature:** Contains 20 per cent N-meta-tolyl phthalamic acid (7R5). **Description:** A flower and fruit setting hormone. Action of 7R5 is known to be systemic and to retard abscission formation, and it has shown considerable promise as a fruit-set chemical on tomatoes, lima beans and peppers. **Availability:** Experimental material, division hopes for registration prior to 1955 season.

FUSAREX. Sterwin Chemicals, Inc. **Chemical Name:** 2,3,5,6-tetrachloronitrobenzene. **Use:** Inhibits potato sprouting in winter storage. Used as a dust.

MINCO FERT. CONDITIONER & GRANULE BOND. Minco Products corp.

Mineral product added to fertilizer mixtures to form granules, as a coating and parting agent when added while bagging and, with pulverized goods before or after solutions to prevent caking. Termed an excellent base, carrier and sticker for pesticides.

RINGWOOD REPELLENT. Ringwood Chem. corp.

Chemical Nature: 5 per cent solution of TNB-A (trinitrobenzene aniline complex) in acetone. **Description:** Taste repellent for protection of dormant deciduous trees and shrubs against rabbit damage, applied by brush or sprayer. Has under development an aqueous solution which may be available this year **Availability:** In 1 and 5 gal. cans.

STA-FRESH. General Chem. div.

Chemical Name: Anhydrous sodium bisulfite, silage grade. **Use:** To keep silage fresh, green and sweet smelling. Treated silage has proved more nutritious and palatable. **Availability:** Commercial.

For More Information—

Here is an alphabetical list of companies, and their complete addresses, with products listed in this review.

American Cyanamid co., Agricultural Chemicals div., 30 Rockefeller Plaza, New York 20, N. Y.

Antara Chemicals, 435 Hudson St., New York 14, N. Y.

Ashcraft-Wilkinson co., Bank of Georgia Bldg., Atlanta 13, Ga.

Atlas Powder co., Wilmington 99, Del.

Carbide & Carbon Chemicals co., 30 E. 42nd St., New York 17, N. Y.

Chemagro corp., 101 Park Ave., New York 17, N. Y.

Columbia-Southern Chemical corp., 632 Duquesne Way, Pittsburgh 22, Pa.

Crowley Tar Products co., 271 Madison Ave., New York 16, N. Y.

Davison Chemical co., Baltimore 3, Md.

Dow Chemical co., Midland, Mich.

DuPont co., Wilmington 98, Del.

Emulsol corp., 59 East Madison St., Chicago 3, Ill.

Florida Agricultural Supply co., Jacksonville, Fla.

Gallowhur Chemical corp., 801 Second Ave., New York 17, N. Y.

Geigy Agricultural Chemicals, 89 Barclay St., New York 8, N. Y.

General Chemical div., 40 Rector St., New York 6, N. Y.

Glyco Products co., 26 Court St., Brooklyn 2, N. Y.

Goodrich, B. F. co., Rose Bldg., 2060 E. Ninth St., Cleveland 15, O.

Grace Chemical co., 7 Hanover Square, New York 5, N. Y.

Grand River Chemical div., Deere & co., 2010 S. Utica St., Tulsa, Okla.

Huber, J. M. corp., 100 Park Ave., New York 17, N. Y.

International Minerals & Chemical corp., 20 N. Wacker Drive, Chicago 6, Ill.

Minco Products corp., Saginaw, Mich.

Monsanto Chemical corp., Organic Chemicals div., 800 N. 12th Blvd., St. Louis 1, Mo.

Naugatuck Chemical div., U. S. Rubber co., Naugatuck, Conn.

New York Hanseatic corp., 120 Broadway, New York, N. Y. (distributors for Farbwerke Hoechst AG).

Niagara Chemical div., Food Machinery & Chemical corp., Middleport, N. Y.

Ninol Laboratories, Inc., 1719 S. Clinton St., Chicago 16, Ill.

Nitrogen div., 40 Rector St., New York 6, N. Y.

Nopco Chemical co., Harrison, N. J.

Olin Mathieson Chemical corp., Mathieson Bldg., Baltimore 3, Md.

Pacific Coast Borax co., 630 Shatto Place, Los Angeles 5, Calif.

Pennsylvania Salt Mfg. Co. of Wash., Tacoma, Wash.

Phillips Chemical co., Bartlesville, Okla.

Pittsburgh Coke & Chemical corp., Agricultural Chemical div., Grant Bldg., Pittsburgh 30, Pa.

Powell, John & co. div., One Park Ave., New York 16, N. Y.

Prentiss Drug & Chemical co., 110 William St., New York 7, N. Y.

Ringwood Chemical corp., Ringwood, Ill.

Sharples Chemicals Inc., 123 S. Broad St., Philadelphia, Pa.

Shell Chemical corp., Agricultural Chemicals div., P. O. Box 1617, Denver, Colo.

Stauffer Chemical co., 380 Madison Ave., New York 17, N. Y.

Sterwin Chemicals, Inc., New York 18, N. Y.

Swift & co., Plant Food div., Union Stock Yards, Chicago 9, Ill.

Tennessee corp., 617–29 Grant Bldg., Atlanta 1, Ga.

Upjohn co., 301 Henrietta St., Kalamazoo 99, Mich.

Velsicol corp., 330 E. Grand Ave., Chicago 11, Ill.

Versenes, Inc., Framingham, Mass.

Wilson & Geo. Meyer co., 333 Montgomery St., San Francisco, Calif.

CFA Attendance at New High

McCollam Named "Man-of-the-Year"

Earle J. Shaw presents "Man-of-the-Year" Award to Millard E. McCollam.

WHEN THE California Fertilizer Association met for its 31st annual convention at Coronado on Nov. 15 and 16, a record-breaking 450 representatives from this country and Canada were on hand to see Millard E. McCollam, western states manager of American Potash Institute, honored as the "Man-of-the-Year."

During the annual business meeting, CFA President B. H. Jones, Vice President W. E. Snyder, Treasurer Jack Baker and Executive Secretary and Manager Sidney H. Bierly were re-elected for the coming year. Virgil A. Frizzell, the Triangle co., was elected secretary, succeeding H. E. Ferguson, and Fred Bryant of Brown and Bryant was elected a director, replacing W. E. Simas. Directors Murray C. McNeil and William E. Snyder were re-elected for three-year terms.

Raise Crops for Consumption

Farmers of the country should return to the sound premise of raising crops for consumption rather than for storage in Government warehouses, suggested Francis R. Wilcox, assistant general manager and treasurer of Sunkist Growers, in a talk following luncheon on Monday. Meanwhile, he warned, farmers are pricing themselves out of most world markets. Last year Wilcox headed a trade mission of USDA to northern Europe, and he feels that stored surpluses is the number one problem of our farm economy and suggested acceptance of foreign currency from countries which are sharing in our aid program, using this money to buy our surpluses for local consumption on a commercial basis.

Jesse Tapp, vice chairman of the board of directors, Bank of America predicted a big new market for chemical fertilizers for use on pastures and rangeland. He said this trend will assure the high level of livestock production which will be needed to meet food demands of our rapidly growing population. The flexible support program of Secretary Benson was praised by Tapp as a boon to California farmers, since rigid controls have always hit newer production areas the hardest. He predicted that 1955 will be a good farm year for California and the Nation.

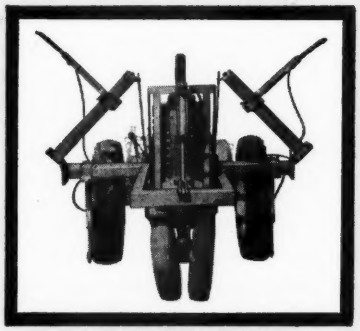
NFA's W. R. Allstetter exhibited two films, one a television short showing typical plant food deficiency symptoms and the other a color film depicting the value derived from scientific soil testing.

Supply Outlook

The fertilizer supply outlook and development of manufacturing fa-

CFA officers and directors: W. E. Snyder, vice pres.; S. H. Bierly, exec. secty. & mgr.; J. M. Quinn; M. C. McNeil; B. H. Jones, pres.; H. G. Conley; V. A. Frizzell, secty; H. H. Hawkins; Jack Baker, Treas. and W. L. Dixon, Jr.

Paul T. Truitt, APFC president; Beverly H. Jones, CFA president; W. R. Allstetter, NFA vice president; Jesse W. Tapp, board vice chairman, Bank of America and Francis R. Wilcox, asst. mgr. and treasurer, Sunkist Growers.



KBH DOUBLE-DUTY APPLICATOR

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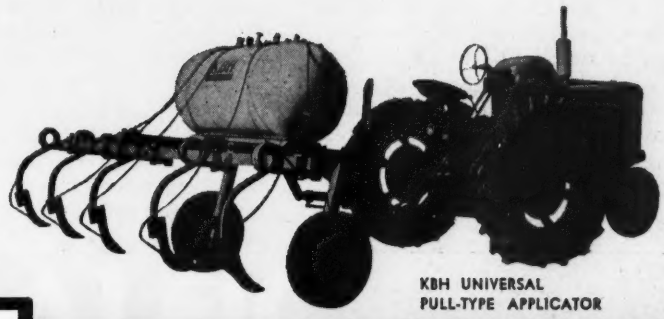
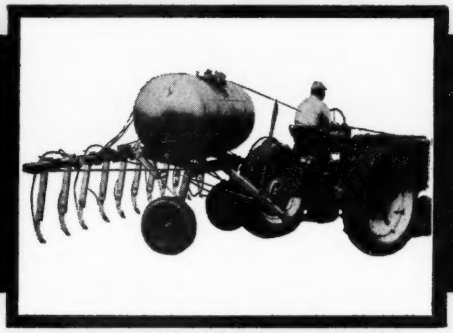


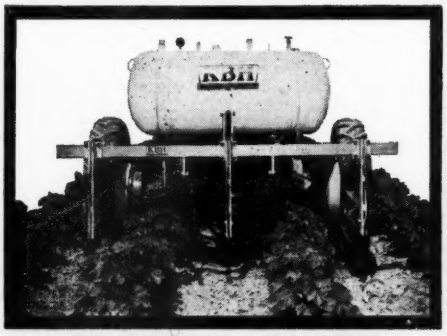
KBH UNIVERSAL PULL-TYPE APPLICATOR



KBH PULL-TYPE BROADCAST APPLICATOR WITH 500 GAL. TANK AND 18 FT. TOOL BAR

KBH ammonia applicators

KBH UNIVERSAL REAR-MOUNTED



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cilities was discussed by APFC president, Paul T. Truitt. He pointed out that for each of the past 16 years the fertilizer industry has marked a new consecutive high in terms of total amount of plant nutrients used. With existing facilities and those now planned or under construction, the fertilizer industry will continue to be able to supply the farmer with all the plant food he requires, Truitt said, but pointed out that seasonal shortages of certain materials, especially heavily used mixtures, will still make it desirable for the farmer to purchase his requirements ahead of actual needs.

M. E. McCollam, Soil Improvement committee chairman, reported on the activities of his committee during the past year and stressed the importance of proper research and the acceptance of its results by the farmer. Arizona farmland received an average of 77 pounds of plant nutrient per acre last year, he stated, the highest in the nation. California was next with an average of 49 pounds per acre, while the U S average was 15 pounds.

Accomplishments of CFA were outlined by Sidney H. Bierly, association executive secretary and manager, who told of trends toward new materials and methods of application.

Entertainment

Cocktail parties for all delegates were sponsored by Balfour, Guthrie & co. and American Potash & Chemical corp. Women were guests of CFA at a cocktail party and luncheon at the Kona Kai club, followed by an excursion of the San Diego Bay area. A steak dinner on Monday night was sponsored by Shell Chemical corp.. and its ammonium sulfate selling agents Nitrogen div. and Producers Sales co. The annual CFA banquet was held on Tuesday evening. ◆

Mexican Government Views Fert. Expansion

By Emil Zubryn
Mexico City

THE MEXICAN government is moving toward the establishment of a strong fertilizer industry within Mexican borders. Guanos y Fertilizantes, S.A., only firm producing chemical fertilizers in Mexico, despite recent expansion moves, has been unable to meet the needs of the national market.

Now the government is studying proposals by a number of U S firms to put up three modern fertilizer plants in the republic, to resolve once and for all the needs of agriculturists without the necessity of importing fertilizers which cost the nation around $12,000,000 dollars annually.

The Department of National Economy, in a special report to President Adolfo Ruíz Cortines, has stressed the need for manufacture of fertilizers to help the agricultural expansion effort.

Studies have been going on for some time for the establishment of key chemical fertilizer plants in Coatzacoalcos, Veracruz; Matamoros, Tamaulipas and as yet an unselected site in the state of Sonora.

A Mexican committee made up of representatives of the Department of National Economy, the Association of Manufacturers, the Bank of Mexico, Nacional Financiera (semi-official credit agency), Petroleos Mexicanos and Guanos y Fertilizantes de México, S.A., has been considering U S proposals.

Interested Companies

American firms—with Olin Mathieson Chemical co., E. R. Squibb, Phillips Petroleum co., Shell Oil co., Union Carbide, Modern Investment co. of Miami, among others —seeking to obtain legal concessions have presented detailed programs for consideration, including exploitation of sulfur deposits in the Isthmus of Tehuantepec, and residues of coke and petroleum for fertilizer purposes.

A total of 50,000,000 dollars would be invested for construction and equipment of three huge plants, with American financial interests asking only a 6 per cent return on the investment, plus rights to sell fertilizers in the Mexico market and for export purposes when production saturates Mexican needs and there is an annual surplus.

Mexican capitalists, always fearful of new ventures, have indicated that they believe 6 per cent is a very small profit margin, and they had asked for 12 to 15 per cent on their investments. This the government found far too excessive and that is why the U S offers are being seriously considered.

Million Tons Needed

With Mexico embarked on a huge irrigation program, with dams incorporating areas formerly unproductive agriculturally, the need for fertilizers within the republic is conservatively estimated at at least a million tons a year. Actually, however, domestic consumption is but 169,000 tons a year, with 90,000 tons of this figure imported.

Aside from U S offers, Guanos y Fertilizantes is attempting to interest Mexican capital in a bid for wide expansion of its facilities. It would also like to put up a plant in Coatzacoalcos and it has plans for a project to utilize petroleum gases in the Isthmus of Tehuantepec area, and it is also asking for Export Import Bank aid to aid its development program. Capitalization of the Mexican firm is now at 55 million pesos ($4,400,000) and the firm has succeeded in lowering its prices for ammonium sulfate from 870 pesos ($69.60) a ton to 495 pesos ($39.60). Prices for other products have also been reduced, such as that for potassium chloride which has dropped from 630 pesos ($50.40) to 578 pesos ($46.24) a ton.

Approval of the U S offers is expected early in 1955. ◆

MALEIC HYDRAZIDE

A helicopter swoops low over Connecticut broadleaf tobacco spraying MH in a sucker control test.

By H. Douglas Tate
Naugatuck Chemical
Div. of United States Rubber co.

MALEIC hydrazide, or MH as it is more commonly known, is a plant growth inhibitor; it stops plants from growing. The degree or extent of growth stoppage depends upon the amount of MH applied to the plant, varying all the way from a barely visible temporary slow-up to permanent inhibition and eventual death of the plant.

These unique growth regulating properties of MH were originally discovered by workers at the Naugatuck Chemical div. of the United States Rubber co.—and a paper was published on the subject in 1949. Since that time more than 650 investigators have experimented with the chemical in the United States, Canada and abroad, and have reported their findings in over 300 publications. Investigators in Canada have contributed widely to this program, working with Naugatuck Chemicals, division of Dominion Rubber co. Limited. Their results have indicated numerous potential commercial applications.

No Effect on Animal Cells

Following publication of the original paper on MH as a growth inhibitor, researchers in the animal sciences, including medicine, became interested in studying its effect on animal cells. The possibility of its inhibiting cancerous growth received particular attention. Results in all cases were negative—that is—no effect.

A complete animal toxicological study on MH was conducted by Food Research Laboratories, Inc. of Long Island City, N. Y. These studies included acute toxicity and long-term feeding tests on rats, running up to two years from weaning, and through three successive generations. Also included was one year's feeding test on dogs.

The Oral LD-50 to rats was found to be 6,950 milligrams per kilogram of body weight. In long-term feeding tests, diets containing up to 5 per cent (50,000 ppm) MH as the sodium salt caused no adverse effect.

On termination of the long-term feeding tests, representative animals from the rat series were autopsied. No consistent abnormalities were revealed.

Histological studies were made of the dogs. No evidence of tissue damage was found in any of the animals.

Feeding tests with dairy cows and rats showed that MH is largely, if not entirely, excreted.

Effect on Plants

When sprayed on a plant, MH is absorbed and moves internally where it blocks growth-promoting hormones. Plant response varies

both with the dosage applied and the plant's stage of development. Often it produces a varied response in the same plant.

For example, MH sprays on young celery plants will promote flowering; whereas application at a later growth stage will inhibit seed stalk development.

Comparison of treated and untreated potatoes. Those at left were grown on plants sprayed with maleic hydrazide two weeks before harvesting, while potatoes at right were untreated. Picture was taken after 7 months storage.

Spraying MH on apple trees in the spring delays growth, but a pre-harvest treatment promotes the development of red color and reduces the softening rate of apples in storage.

Present Commercial Uses

At the present time MH is being used commercially as follows:

1. To prevent the growth of suckers on flue-cured tobacco.
2. To inhibit the sprouting of onions and potatoes in storage.
3. As an herbicide for the control of quack grass, wild onions and wild garlic.
4. To retard the growth of grass and hedges.

Sucker Growth Control

Topping and suckering of tobacco plants substantially increases yield and value of the crop. Removal of the flowers or topping forces growth of suckers which are normally pulled off by hand.

Hand suckering is a particularly odious job and runs at an average cost of about 30 man hours per acre in some areas. In recent years it has been difficult, and in some cases next to impossible to secure labor for this operation. One spray of MH, currently costing about $12.50, has consistently given good sucker control with no adverse effect on quality or yield.

In fact, indications are that MH may improve both quality and yield. For example, a farmer in one southeastern state received an average of eight cents a pound more for his MH-treated tobacco than for that suckered by other means. However, claims along this line must await further verification.

In several large-scale field tests up to several hundred pounds per acre yield increase was obtained through the use of MH. There was less damage to the plant and less actual waste on the finished plants. Carefully controlled experiments indicate that MH treatment may even eliminate the need for topping. This lead, however, needs further verification before it can be recommended commercially.

According to some experts on flue-cured tobacco, hand suckering damages tobacco to the extent of 1 to 5 per cent of the crop. MH treatment avoids this loss. Taking 2.5 per cent as the average, on a 2,000 pound per acre yield at 50 cents a pound, this alone would mean a saving of $25 per acre.

MH was used commercially to a limited extent on flue-cured tobacco in the United States in 1953 following several years of extensive field testing. It was widely tested on burley tobacco in the Mid-South in 1953 and 1954, and on flue-cured tobacco in Canada in 1953 and 1954. Indications are that commercial usage may be extended into these areas in 1955.

Controlling Sprouting

You are all familiar with what happens to onions and potatoes in storage—particularly if storage temperatures get up to 50° F or higher. Onions and potatoes send out shoots, wither and wrinkle and to all intents and purposes are a complete loss. To avoid this loss, growers must market their crops at a time when the market is already glutted, and the purchaser in turn must assume the risks of storage.

A pre-harvest spray of MH on potatoes and onions has been repeatedly shown to give good sprout inhibition even at storage temperatures of 55° to 60° F for six months.

MH is of particular interest to the potato chipping industry where holding potatoes in storage for chipping in the off-season requires that they be kept at temperatures of 45° F. or less to prevent sprouting. When potatoes are held at that temperature, however, their starch is converted to sugar. Prior to chipping such potatoes, reconditioning at higher temperatures must be undertaken to induce a reconversion of the sugars back to starch. According to some experts on the subject, this reconversion is never complete, and off-color chips result. MH-treated potatoes can be held at higher temperatures, thus avoiding such difficulties.

Regarding edible onions, a report from a midwest experiment station states that a pre-harvest spray of MH completely eliminated the sprouting of Spanish onions in storage. At the end of eight months, 90 per cent of the untreated bulbs had sprouted, whereas nothing developed from those treated with MH. Similar reports from workers at the Ontario Agricultural College at Guelph and others have confirmed this.

Sprouting of such crops as carrots, radishes, turnips, beets, parsnips and rutabagas can be pre-

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Dr. K. P. Buchholtz, U. of Wisc., examines young corn in a plot where quack grass has been controlled by MH-40. Plot in foreground is untreated.

vented by pre-harvest sprays, but commercial usage on these crops has not as yet developed. Canadian workers have obtained particularly good results on rutabagas and have suggested commercial usage, especially for those growers who export this crop.

Controlling Quack Grass

Quack grass is a particularly noxious weed to the farmer. Crops must be constantly protected from this choking weed, and it has been repeatedly demonstrated that MH will do the job.

Workers at the University of Wisconsin and experimental stations at Kapurparing and Norandin in Canada and others have found that if MH is sprayed on quack grass in the spring when it is about 4″ to 10″ in height, and then the weed plowed under four to eight days after treatment, effective control will result. For this use it has the unique advantage that good control can be obtained without altering regular cropping practices —that is—crops can be planted immediately after plowing. No harmful residue is left in the soil, as has been true with various materials tried in the past.

Grass Inhibition

Large-scale experiments along parkways in Connecticut covering a period of five years have demonstrated that frequency of mowings on highway areas can be markedly reduced without adverse effect on growth or appearance in subsequent years, by proper application of MH.

Some treatments reduced mowings from 19 to two during a season and reduced maintenance costs more than $50 an acre. Since treatment costs are at present around $25 an acre, MH is most economical on turf which requires a large number of mowings or is in areas difficult or impossible to mow with large machinery.

At present MH is not suggested for general use on home lawns, golf greens or heavily traveled areas.

Hedge Inhibition

During the last few years, several workers have demonstrated that MH can be used to advantage to retard growth and reduce the number of trimmings of privet and pyracantha hedge. This market will be exploited in 1955.

Potential Uses For MH

In some areas, such as Hawaii, sugar cane has a tendency to flower, and as a result yield less sugar. In large-scale tests MH sprays applied by airplane have prevented flowering and have increased yields as much as two tons per acre.

Selective control of white cockle and curled dock, two common weeds in alfalfa in the North Central states, has been obtained by light applications of MH.

In Louisiana, dilute MH sprays applied shortly before harvest have given a substantial improvement in the color of peaches. In Delaware and several other states, late summer MH sprays have controlled strawberry runner growth, thus eliminating the need for hand removal, a time-consuming and expensive operation.

In California, light pre-harvest applications on olives grown for oil have reduced the pull necessary to get the olives from the tree as much as 200 per cent, thereby simplifying and reducing the cost of harvesting.

In Michigan MH sprays gave significant yield increases by reducing storage losses of sugar beets; and on the same crop in California. increased sugar yields were obtained by spraying with MH to prevent bolting.

Dipping cut roses in a dilute MH solution extended their life in the home by three days, according to work done at the Ontario Agricultural College.

George Knowles of the Central Experimental Farm in Ottawa, Canada, has done extensive experimental work with MH as a control for wild oats, and recently he reported that it appears possible to control wild oats in barley and flax with this chemical. The procedure here involves a highly selective type of weed control, and timing of applications is particularly important.

Applications on barley are made when the barley is in the soft dough stage, and the wild oats at this time are fully headed with some seeds in the milk stage. On flax, sprays are delayed until the seed balls are formed. Under these conditions MH prevents development of viable seeds in wild oats with little or no significant adverse effect on barley or flax.

As farm chemicals go, MH may be considered a relatively expensive material. It is new, however, and naturally every effort is being made to reduce its cost to the grower. In many cases such as tobacco, potatoes and onions, the cost and treatment picture is very favorable; whereas, in cases such as quack grass control, the cost may be such as to limit commercial usage to high value acreage.

Fundamental studies on MH absorption and translocation through the use of radioactive material and other techniques are now in progress. There exists good reason to believe that new formulations will result from these studies —formulations giving better performance at a lower cost to the consumer.

The potential markets for MH run into many millions of pounds. For example, in the United States and Canada on tobacco alone it is around three million pounds. To estimate the potential markets presently indicated would result in something approaching astronomical, if not fantastic, figures. Perhaps its potentialities are best described by the comments of a well known horticulturist who said, in effect, that MH shows all indications of being one of the most significant developments of recent years in the farm chemicals field. ◆

Haller and Archer Speak at ASA Standards Conference

AT THE recent National Conference on Standards the American Standards Association presented an agricultural symposium which included addresses by USDA's Dr. H. L. Haller and J. E. Archer of the Patent division, American Cyanamid co.

Haller reviewed the problem of pesticide nomenclature and told delegates of the program of ASA's sectional committee K62 on common names for pest control chemicals. The scope of this group is to develop common names for pest control chemicals, he stated, where such names appear desirable for popular designations of the chemicals.

Such activity was previously handled by an Interdepartmental Committee on Pest Control, a group formed in 1947 by the late Dr. S. A. Rohwer. It was organized primarily as a coordinating group, however, and because of this and the lack of adequate clerical assistance terminated its activities in approving coined names of pesticide chemicals.

12 Groups Represented

A formal committee, ASA sectional committee K62 on Common Names for Pest Control Chemicals, was established early in 1954 and includes representatives of some 12 organizations. Haller reported that the group has under way preparation of an "American Standard Procedure for the Acceptance of an American Standard Common Name for a Pest Control Chemical."

As outlined by Haller the procedure consists of selection of a common name by the sponsor of the chemical; preparation by the sponsor of a statement providing data on properties of the chemical and other information; submission of statement to the committee; review and action by the committee; adoption of the common name and release of the American Standard by ASA.

Haller stressed that the committee recognizes the difficulty of coining common names that "do not infringe or encroach" on names in various fields and is also aware of the "difficult problem of preventing trade-marking of a name in a foreign country."

It is believed, he concluded, that agreement can come only through cooperation of the groups concerned and that a greater exchange of information and data by agencies here and abroad should bring the desired results.

Difficult Task

J. E. Archer pointed out that the establishment of a common name acceptable throughout the world is more difficult than might be supposed. It should be acceptable to those speaking different languages and, he added, should comply with general standards devised by technical people so that it will not be "misdescriptive" and, if possible, should be suggestive of the type of chemical compound.

Once this has been determined, Archer said, it is necessary to investigate its availability for use in the U S through a trade-mark search.

Considering the difficulties in adoption of a common name for world wide use he pointed out that there are over 150 countries with trade-mark systems, each of which may differ from the others in some respect. If it is expected that a product will be sold in substantial volume, Archer recommends that trade-mark investigations be conducted in important world markets for such a product.

Once it is determined that a name is available for world-wide use, it must be decided whether or not trade-mark registration should be obtained to prevent registration of the common name by others.

In the U S, Great Britian and a few other countries, he added, it is possible to deposit a statement to the proper authority indicating that a particular name has been selected as the common name for a particular product. This should take care of any eventuality excepting prior use claims.

Archer stressed that a trade-mark search is not necessarily complete, because some are in use for long periods without registration and the trade-mark often does not appear in directory listings.

In many countries, he continued, a trade-mark can be registered without regard to use and a prior user may have few, if any, rights against the registration. To prevent registration in some countries it must be shown that a word has become common or generic in the particular country.

While the word or term might have become generic in this country through use and publicity, this might not be true overseas and as a result it is often very difficult to show that a term has become generic where commercialization is not well established.

Archer commented that, when a product is commercialized in the U S, and widely publicized, the information passes rapidly into foreign countries where unscrupu-

lous parties can proceed with registration.

Nothing can be done in such situations except to purchase rights from the owner-registrant.

File Applications Quickly

In order to avoid complications, Archer recommended that trademark applications be filed as soon as possible after adoption of a particular name for a product.

Proposals for establishment of common names have been set up by the USA committee for ISO TC/81, and Archer believes that these are being considered in various member countries which are also making suggestions.

He hopes that a satisfactory system will soon result but pointed out that final solution would seem to be establishment of an international convention which would set up through treaty the means for protection of common names.

Referring to the procedures outlined by Haller for ASA sectional committee K62 in which the sponsor must certify that a search has been made and findings have been submitted, he suggested that some additional evidence be required to show that the common name is suitable for use in one or perhaps a few of the principal countries where the product probably would be widely used or produced commercially. ◆

Liquid Pesticide Terms Defined

THE September-October issue of the NAC NEWS AND PESTICIDE REVIEW reports on definitions set up by an Advisory Council on Pesticidal Chemical Colloid Systems relating to liquid systems of pesticide formulations.

Made up of government scientists and industry representatives the council was formed to make an analysis of terms used to designate these formulations and terms used in conjunction with them. Chairman of the group is Sol Epstein, Emulsol corp.

Definitions submitted by the council have been approved by the Technical Advisory committee of NAC, although Epstein has pointed out that they are not final and are subject to revision and addition. Other definitions, said Epstein, will be forthcoming.

Here are the terms and their definitions as approved by the NAC committee:

Emulsion: A dispersion of one liquid in a second immiscible liquid.

Spray or Dip Emulsion: A mobile emulsion of suitable stability exhibiting desired pesticidal action.

Emulsifiable Concentrate: A liquid capable of forming a spray or dip emulsion when mixed with water; usually consisting of water-insoluble pesticidal chemicals plus surfactants with or without solvents.

Emulsifiable Concentrate—Clear Emulsion Type: An emulsifiable concentrate which, when mixed with water, forms an essentially clear aqueous solution.

Emulsion Concentrate: An emulsion capable of forming a spray or dip emulsion when mixed with water; usually a viscous mixture consisting of water, water-insoluble pesticidal chemicals and surfactants, with or without solvents.

Surfactant: A material which, when used in a pesticidal formulation, imparts emulsifiability, spreading, wetting, dispersibility or other surface-modifying properties.

Oil Phase: The non-aqueous liquid portion of an emulsion which consists of water-insoluble pesticidal agents with or without surfactants or solvents.

Broken Emulsion: An emulsion in which there is a visible separation of the originally dispersed phase.

Oil Separation (Free Oil): The portion of a broken emulsion observed as free oil.

Creamed Emulsion: An emulsion consisting of visible gradations of emulsified layers.

NAC points out that confusion has existed as to a proper separation of certain liquid formulations and that research workers and others have been guilty of a failure to use standard designations. The work of the council is designed to correct the situation.

Supplementing these definitions the NAC committee has developed and recommends the following definition of a pesticide dust:

A dust is defined as an active ingredient or ingredients formulated with suitable carriers, diluents, extenders and grinding aids. This does not include granular or pelletized formulations.

1. **A dust can be readily brushed through an 8 or 10 mesh screen with a soft brush.**
2. **The dust should contain no hard lumps.**
3. **The dust should be a homogenous mixture as determined by a spatula test.**
4. **When tested by a dry screening technique or when made into a water paste with a suitable wetting agent, diluted with more water and poured through a screen with running tap water with limited brushing, 85 per cent should go through a 200 mesh sieve and 99 per cent should go through a 100 mesh sieve.**
5. **Not less than 85 per cent of each active ingredient should pass through a 200 mesh sieve when tested in accordance with item 4.**

NAC reports that the council has under consideration a project for developing field and lab tests to determine physical properties of pesticides and the relationship of those tests to the intended use of the formulations. ◆

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Suggestions for a

Safety Incentive Program

AT THE recent Fertilizer section, National Safety Council sessions, A. E. Johnson, director of safety and industrial training, Illinois Farm Supply co., reviewed his company's experience with a Safety Incentive Program.

Johnson pointed out that all plant employees participate in the year-long affair and that they like the program. It goes a long way, says Johnson, in stimulating interest of all employees in a good record, providing incentives for safe work and aiding employee relations through a friendly spirit of competition.

Here's how the Illinois Farm Supply program is organized:

Employees are divided into three teams, each choosing a captain. Team captains, along with the plant manager, maintenance superintendent and a management appointed safety committee chairman serve on the safety committee.

Functions of this group include monthly review of all safety suggestions and a monthly inspection of the plant.

How Points Are Earned

Team members earn points in various ways including:

Submitting acceptable safety suggestions.

Conducting a portion of a group safety meeting.

Working a full month with no accidents requiring more than first aid.

Working a full month without being absent or tardy.

Points can be taken away too, with demerits for:

Not reporting accidents.

Not wearing safety equipment.

Injuries requiring physician's care, lost time accidents.

Team and individual standings are posted periodically, and at the end of the safety contest year employees order prizes from a supply catalog.

Schedule of Points

Here's the schedule of points as outlined by Johnson:

Winning team members: 1 cent per point.

Members of second place team: ¾ cent per point.

Members of third place team: ½ cent per point.

The average number of points earned during the year is 800–1000 and employees can select prizes such as clock radios, dishes and fountain pens for presentation at an annual safety picnic.

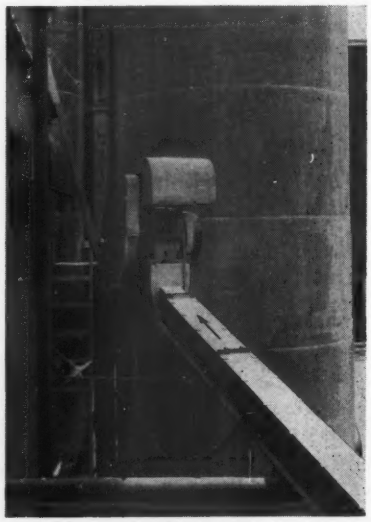
Rules governing the contest can and usually are changed at the beginning of each contest, added Johnson. Different ways of awarding merits and demerits can be devised and, if it is found that one team can build up a too-imposing lead over all the others, ways and means of correcting the situation are sought. ◆

Conveyors Solve Quick Lime Handling Problem

One large eastern fertilizer manufacturer has solved the problem of handling quick lime by installation of two Redler conveyors from Stephens-Adamson Mfg. co.

The company switched from bag to bulk handling with conveyors moving the material from a rail siding to storage and then to processing areas. One 7-inch slope unit moves material to the storage area where it discharges to a loop boot elevator running to storage or to the plant processing areas. Quick lime is recovered from storage tanks by the loop boot unit and discharged to processing.

The installation is running at a 200 ton per week rate. ◆



ABOVE: Closeup of drive on slope Redler. Loop boot type elevator lifts to storage or to processing.

LEFT: Slope Redler moves quicklime from track hopper to storage. It runs 16 hrs./day, 5 days a week.

by Dr. Melvin Nord

PATENT REVIEWS

Here is the first of a new, monthly FARM CHEMICALS feature edited by Dr. Melvin Nord, Detroit consultant in legal and technical problems. We hope that it will prove of interest and assistance to all FC readers.

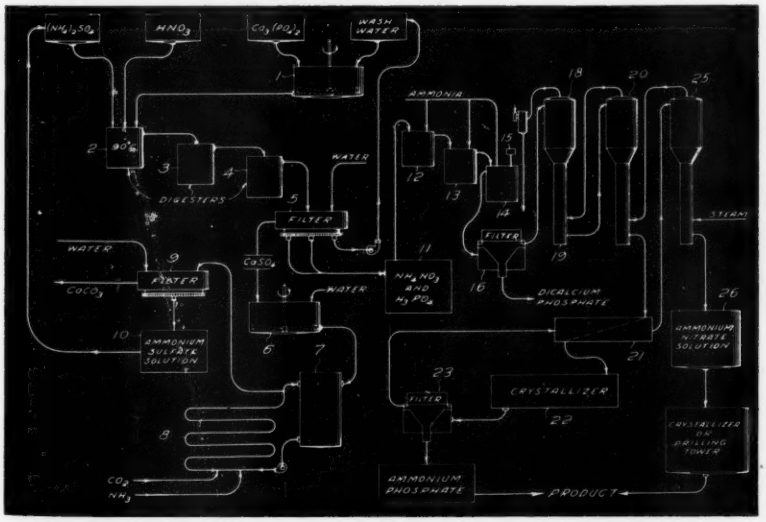
Dr. Nord is a chemical engineer with six years of industry experience and he has taught both chemical engineering and law at Wayne university. He is a Registered Professional Engineer and a Registered Patent Attorney, member of the Michigan and Federal bars, does consulting work in chemical engineering and practices as a patent attorney.

Author of some 50 technical and legal articles, he has published two books—"Textbook of Engineering Materials" and "Legal Problems in Engineering" (the latter will soon be issued by Wiley).

Many readers are probably already familiar with Dr. Nord, for he conducts a dozen regular departments in various technical magazines. We feel his efforts will prove to be an excellent addition to the FC editorial line-up.

U S 2,689,175. Issued Sept. 14, 1954 to Samuel Stretzoff and Edward S. Roberts, and assigned to Chemical Construction co.

In this invention, ground phosphate rock is reacted with an aqueous nitric acid, instead of sulfuric acid, while supplying the sulfate radicals necessary for gypsum formation by adding an ammonium sulfate solution. The result is a slurry of easily filterable calcium sulfate in an aqueous solution of phosphoric acid and ammonium nitrate. The separated filter cake may then be reslurried with ammonia and carbon dioxide to form an ammonium sulfate solution, which is returned for reaction with additional quantities of ground phosphate rock and nitric acid. The solution is neutralized with ammonia to a pH value where substantially all of the remaining calcium content is separated out as dicalcium phosphate in easily filterable form. Almost all the uranium and other rare earth metals that may have been present in the original phosphate rock are also precipitated by this procedure along with the dicalcium phosphate and may be recovered from this precipitate.



The process is shown diagrammatically in Fig. 1. The starting point is indicated by the expression $Ca_3(PO_4)_2$, which is the principal ingredient of phosphate rock. The conditions of operation are specified in the patent.

The advantages claimed are as follows: (1) Nitric acid, which is available in unlimited quantities by the air oxidation of ammonia, is used to replace sulfuric acid, which is relatively scarce due to the shortage of high grade sulfur. (2) The sulfate values used to precipitate calcium from the phosphate rock as gypsum are recovered and reused as ammonium sulfate with the expenditure only of carbon dioxide, which is cheap and plentiful. (3) The employment of nitric acid in the digestion produces a high grade ammonium nitrate fertilizer. (4) The nitric acid digestion results in the formation of an easily filterable gypsum precipitate. (5) Rare earth metal compounds are concentrated into a recoverable form.

U S 2,689,174. Issued Sept. 14, 1954 to Jonas Kamlet, assigned to Mathieson Chemical corp.

Ammonium methylene-bis-(iminosulfonate) is claimed as a herbicide in this invention. Examples of its effect on weeds, poison ivy, and quack grass are given in the patent specification.

U S 2,690,447-8. Issued Sept. 28, 1954 to Christian B. Luginbuhl, and assigned to E. I. du Pont de Nemours and co.

Zinc ethylenebisdithiocarbamate has found considerable commercial usage as a fungicidal agent, especially in application to agricultural crops. However, the product tends to suffer from loss of active ingredients during storage. The inventor claims to have found a method for avoiding this. The process involves suspending the product in slurry form in acidified water at a pH of about 3 for at least 30 minutes. This can be done to the crude material during manufacture, or to the finished product.

A number of specific examples are given in the patent specification.

U S 2,690,965, issued Oct. 5, 1954 to Robert E. Edmond and Francis G. Moffat, and assigned to Standard Oil Development co.

Described is a method of selectively eradicating weeds from transplanted celery plots. The herbicide used is an aqueous emulsion of a refined petroleum oil having a boiling point range of 300–400° F., an aromatic content of 6-24 volume per cent, and a naphthenic content of 41-94 volume per cent. A few per cent of an oil-soluble emulsifying agent is added, which lowers the surface tension of water. The amount of emulsion used per acre is from 20 to 100 gallons, of which 30-60 volume per cent is oil.

Control of Verticillium Wilt by Means of Chemotherapy

Summary of Experiments

Paul E. Waggoner
Conn. Ag. Exp. Station

Kennebec potatoes were planted in three fields with a history of Verticillium wilt. Wilt symptoms and the pathogen were found again in all three fields in 1954. Seed and soil treatments with a conventional fungicide (zineb) and foliage sprays of terramycin or HD 469, a promising chemotherapeutant against Fusarium wilt of tomato, did not consistently alter wilt symptoms or yield.

A single foliage spray of a high concentration of the sodium salt of 2,4-D or terramycin plus 2,4-D applied 40 days after planting distorted the plants for about 20 days. When the plants were scored for wilt symptoms 82–112 days after planting, the plants sprayed with 2,4-D or 2,4-D plus terramycin had significantly less severe symptoms in two fields and slightly less severe symptoms in one field. When the 2,4-D sprayed potatoes were harvested, they yielded 80, 110 and 79 per cent of the yield of the checks.

These experiments indicate that wilt chemotherapy by means of growth regulators is a method that may be developed into a useful control method. This is particularly important because of the lack of satisfactory control methods at the present time.

Book Department

Here is a new, regular FC feature which will make it easier for you to obtain books of special interest to the fertilizer-pesticides industry. Just indicate which books you desire, fill in the coupon and mail with your remittance (no C.O.D. orders)

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Manual on Fertilizer Manufacture, 2nd Ed., by Dr. Vincent Sauchelli, Davison Chem. co. $4.50

An up to date revision of a well known standard for those engaged in fertilizer production. This second edition provides added information on mixed fertilizers, ammoniation, granulation and plant feeding. A must for all fertilizer manufacturers and those interested in the industry.

Sulfuric Acid Tables Handbook, by H. C. Moore. $3.50

For all those working with sulfuric acid, a book of tables prepared to save time and effort in calculating acid stocks.

Hunger Signs in Crops 2nd Edition. $4.50

Compiled by 19 leading authorities, "Hunger Signs" is the well known joint effort of the NFA and the American Society of Agronomy.

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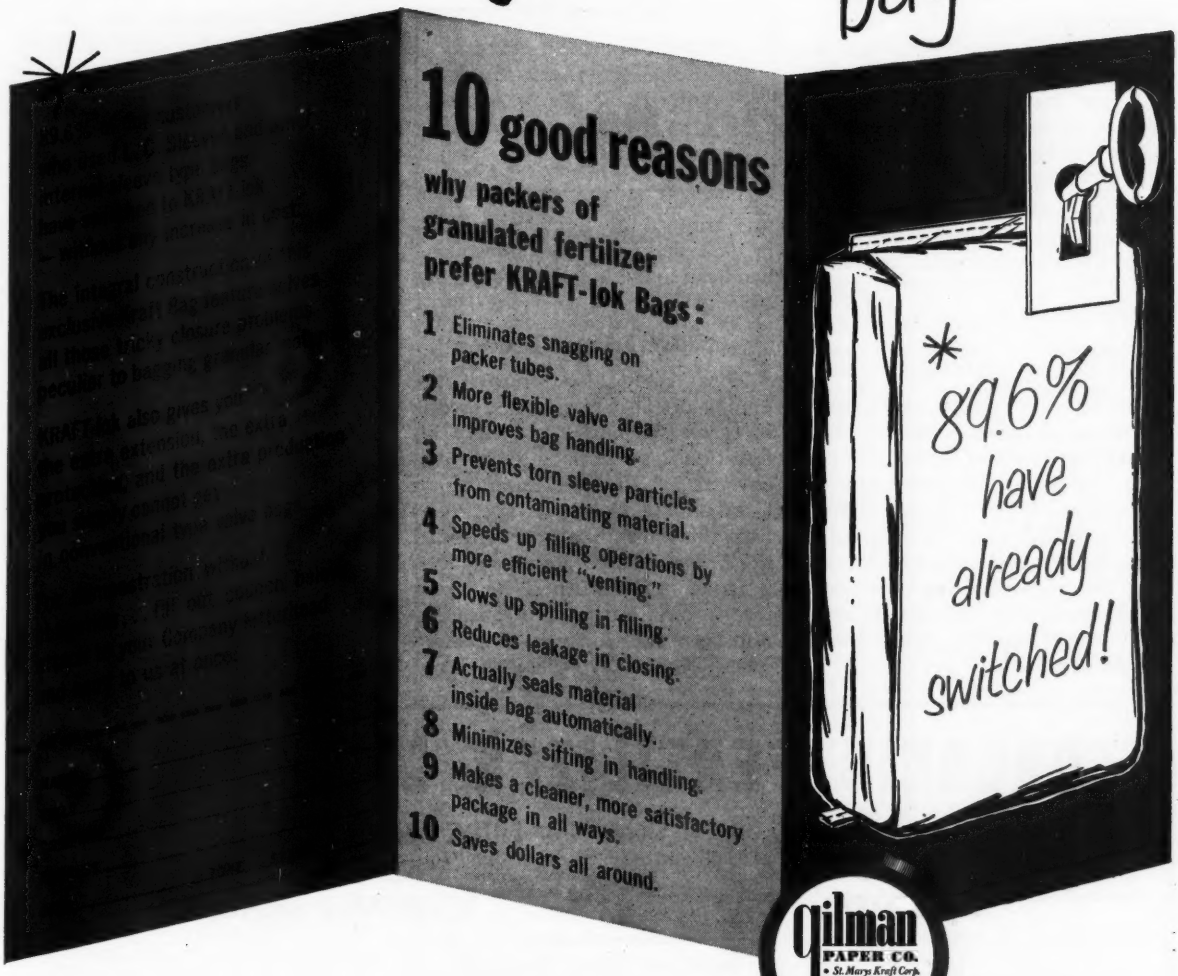
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PEST REPORTS

Reviewing 1954 New Insect Distribution

The year of 1954 was celebrated as the 100th Year of Professional Entomology. Although outstanding progress was made during the period in the control of insects it was repeatedly pointed out that the fight is never ending. In order to point up just one phase of this continual fight it is believed that a review of some of the more important new insect distribution and damage records reported during 1954 might be interesting.

Three of the most important new insect distribution records of the year involved the finding of gypsy moth, white-fringed beetle and European chafer at points remote from established infested areas.

Gypsy Moth

During May gypsy moth was discovered at Lansing, Mich. This infestation involved about 10,000 acres. An eradication program was begun immediately and over 85,000 acres were sprayed. During subsequent surveys on approximately 1,600,000 acres, one egg mass was found within the sprayed area and three very localized infestations outside the area.

New Jersey also reported a gypsy moth egg mass find. On Nov. 22 a single egg mass was taken in the northernmost tip of the state and within one-half mile of Port Jervis, N. Y. Although one male moth was trapped at Englewood Cliffs in 1953, no gypsy moth infestation had been found in New Jersey since 1935.

Presented in cooperation with the Economic Insect Survey Station, Plant Pest Control Branch, Agricultural Research Service, USDA.

White-Fringed Beetle

New Jersey also reported the finding of the white-fringed beetle in early December. A heavy infestation in sweet potatoes was discovered at Vineland, in northern Cumberland county. Specimens from this infestation were identified as *Graphognathus leucoloma* race *imitator*. Prior to the New Jersey record, white-fringed beetle had not been found north of eastern North Carolina. White-fringed beetles also continued to spread in known infested states, and of particular importance were the finds in the delta area of Mississippi, and in Hardeman county, Tenn.

European Chafers

Adult European chafers were trapped June 24 near Capon Bridge, W. Va. This represented the first find of this serious pest of turf outside of the state of New York, and the Meriden, Conn., area. Outside the original known infested areas near Newark, N. Y ., the chafer was taken for the first time in 1954 in the Buffalo, Elmira, Liverpool, Niagara Falls and Syracuse areas.

Cereal & Forage Pests

Among the cereal and forage pests, several new important records were reported in 1954. Sweetclover weevil was reported from Oregon and Utah for the first time. Subsequent surveys in Utah showed this pest to be rather widely established in the state. The weevil was also found in several new areas in Washington state.

The alfalfa weevil, a relatively new pest in the East, was taken for the first time in West Virginia during May with light infestations being found near Charles Town. The insect continued to spread in several states, particularly New Jersey and Virginia.

Although not necessarily new in distribution but in being responsible for economic damage to alfalfa in the US was the yellow clover aphid *Myzocallis trifolii* which caused heavy losses in Arizona, California, Nevada and New Mexico. This species has been known to attack clover for several years, but this is the first year it has been

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recorded as a pest of alfalfa. New ground pearl records were reported from North Carolina and California. *Eumargarodes laingi* was collected in the former state and *Margarodes meridionalis* in the latter. These insects attract attention in some areas as pests of grasses, especially in lawns. The southwestern corn borer extended its known range eastward in Arkansas as far as Van Buren and Faulkner counties. In Missouri the extension was north across the Missouri river into Platte county and east to Dallas county.

Fruit Insects

The outstanding new fruit insect record of 1954 was the finding of Mexican fruit fly in California which, heretofore in the United States, was only in the Rio Grande valley of Texas. A single specimen was taken in a grapefruit tree in San Ysidro, San Diego county, August 9. The California discovery was not necessarily unexpected since Mexican fruit flies had been found just over the border in Baja California, Mexico for a period of several months prior to the California find. An intensive eradication program is under way on both sides of the border.

The walnut husk fly was found for the first time in Yakima, Wash., in October and in Sonoma county, northern California, near the end of the year. Although the walnut husk fly has been an important pest in southern California for some time, this new find is especially important to Persian walnut growers in the northern section.

A small infestation of Mexican bean beetle found at Twin Falls, Idaho, in August highlighted the new records for truck crop insects. As far as known this was the first occurrence of this major pest of beans in that state. Eradicative measures were carried out and subsequent surveys in the area failed to reveal any infestation. The tomato russet mite, which has attracted considerable attention in some of the eastern states in the past two or three years, was found for the first time in local areas of Virginia and North Carolina during 1954.

Cotton Insects

The spread of pink bollworm of cotton continued in some of the infested states, particularly Oklahoma, Louisiana and Arkansas. Although the pink bollworm quarantine had included all of Oklahoma, finds this year extended the infestation to Osage county which approaches the northern boundary of the cotton belt. In Louisiana all newly infested counties were within the quarantined area, but in Arkansas finds were recorded outside the quarantined area both to the east and north with specimens having been found in Clark, Logan and Yell counties.

The cotton stem moth, a potential pest of cotton known previously in this country only in eastern New York and local areas of Massachusetts and Connecticut, was taken in several coastal areas of New Jersey during the summer.

Another insect previously recorded in the area concerned but which caused economic loss for the first time in 1954 was the brown cotton leafworm.

This insect was responsible for considerable damage to cotton in the south central, eastern and upper coastal areas of Texas. Specimens of the pest were taken late in the season in western Louisiana.

There were several new records for pests affecting forest, shade trees and ornamentals. The European pine shoot moth was collected for the first time in Maryland, while a long-horned weevil (*Calomycterus setarius*) was reported for the first time in Vermont. Another weevil (*Mecinus pyraster*) was found in Maryland during September. This is a new record for the US. Neither of these weevils is apparently of any great economic importance. European earwig, which occurs rather widely over the eastern and western states

Calendar

Jan. 4-5—7th annual Pesticide school, College Union Bldg., N. C. State College, Raleigh.

Jan. 5-7—Northeastern Weed Control conf., New Yorker hotel, New York City.

Jan. 6-7—Nebraska State Weed conf., Hotel Lincoln, Lincoln. Chemical and industrial equipment exhibits included.

Jan. 6-7—Insect Control conf., Mississippi State College, State College, Miss.

Jan. 6-7—Texas Fert. conf., Texas A&M, College Station, Tex.

Jan. 6-7—Fert. Industry conf., U. of Ill., Ill. Union Bldg., Urbana.

Jan. 10-12—Middle States Garden Supply Show, Hotel Sherman, Chicago.

Jan. 14—American Society of Agronomy, Miss. section, State College, Miss.

Jan. 17—Iowa Fert. Mfrs. conf., Iowa State College, Ames.

Jan. 17-19—8th annual meeting, Southern Weed conf., Hotel Soreno, St. Petersburg, Fla.

Jan. 17-19—Cotton States branch, ESA, meeting, Tampa Terrace hotel, Tampa, Fla.

Jan. 17-19—Pacific NW Vegetable Insect conf., Imperial hotel, Portland, Ore.

Jan. 18—Ga. Plant Food Educ. Society annual meeting, Conner Hall, U. of Ga., Athens.

Jan. 18, 25—Chem. & Allied Products group of the Nat'l. Assn. of Purchasing Agents. Chicago, Jan.18; New York, 25.

Jan. 19—American Society of Agronomy, Ga. section, Athens.

Jan. 19—NW Cooperative Spray Project, Imperial hotel, Portland, Ore.

Jan. 19-21—2nd Pacific NW Agricultural Chemical Industry conf., Benson hotel, Portland Ore.

Jan. 20-21—Joint meeting, Chemical Market Research Assn., and Commercial Chemical Devel. Assn., Edgewater Beach hotel, Chicago.

Jan. 24-26—Pa. Lime & Fert. Salesmen's School, Pa. State University, State College.

Jan. 24-27—Plant Maint. and Eng. Show, International Amp., Chicago.

Feb. 1-3—Eastern States Garden Supply Show, 71st Infantry Regiment Armory, New York City.

Feb. 7—Tenn. Seedmen's Assn. annual meeting, Andrew Jackson hotel, Nashville.

Feb. 7-9—Assn. of Southern Agricultural Workers annual meeting, Louisville, Ky.

Feb. 10-11—Crop and Soil conf., Oklahoma A&M, Stillwater.

Feb. 14-16—Centennial Symposium "Nutrition of Plants, Animals and Man," Mich. State College, School of Agriculture, East Lansing.

Feb. 17-18—Annual joint meeting, Midwestern agronomists and fertilizer reps., sponsored by Middle West Soil Improvement committee, Palmer House, Chicago.

Feb. 23-25—Ohio-Indiana conf., on use of aerial equipment in agriculture, Purdue University, Lafayette, Ind.

March 7-9—NACA Spring meeting, Chase & Park Plaza hotel, St. Louis, Mo.

March 8-9—Western Production conf., Hotel Westward Ho, Phoenix, Ariz.

March 22-24—National Farm Chemurgic Council annual conf., Columbus, O.

March 24-25—North Central States branch, ESA, meeting, East Lansing, Mich.

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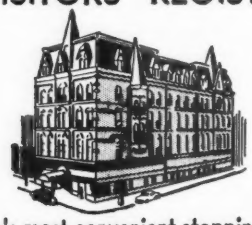

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was reported for the first time in Delaware and Maine. A new record for the country was established in Massachusetts during August when a linden mite (*Eotetranychur tiliarum*) was collected on linden at Amherst. The potential of this pest is unknown.

Stored Products Pests

Largely in connection with survey for the khapra beetle, a pest of stored products which was found in the Western Hemisphere for the first time in 1953, having been reported from California, several new records were established. The beetle, itself, was reported for the first time in 1954 from Arizona and New Mexico and several additional counties in California. Two minor beetle pests of stored grain were reported from California. These were identified as *Lophocateres pusillus* and *Palorus ratzburgi.* A dermestid (*Attagenus alfierii*) was found during August in several locations in Arizona. This represents a new record for the Western Hemisphere. As far as known the species is not of economic importance. Lesser grain borer was collected in Idaho for the first time, being collected in a feed mill in Plymouth. ◆

Literature

Patent Abstract Series. PB 111465 Chemical Products and Processes, $3.00. Office of Technical Services, US Department of Commerce, Washington, D. C.

Important details are included in 1,350 abstracts of Government owned inventions along with instructions on how to get more information and how to apply for use of the inventions under nonexclusive, royalty-free licenses. Construction is detailed in the abstracts for devices and products, the identity of chemical compounds is disclosed and, in the case of processes, procedure is spelled out.

Report of the 39th National Conference on Weight and Measures, 1954. National Bureau of Standards Misc. Publication 212, 108 pages, 50 cents. (Order from Government Printing Office, Washington 25).

Contained are addresses and reports delivered at the conference on topics including check weighing scales, electric flowmeter, reports of conference committees on specifications and tolerances, methods of commodity sales, legislation and other subjects.

The Response of Crops & Soils to Fertilizers, second edition. 1954. by W. B. Andrews, agronomist, Mississippi State College and Experiment Station, State College, Miss. $4.50.

This second edition includes much additional information on the use of anhydrous ammonia and other forms of liquid nitrogen for fertilizer usage.

It also deals with other forms of nitrogen and other elements, soil organic matter, buying fertilizers, effects of placement, green manures and related subjects.

Super in Sept.

Shipments of all grades of superphosphate during September totaled 103,447 tons, or an increase of 22 per cent from the previous month's volume and a 6 per cent increase from the figure reported for September, 1953.

Stocks on hand at the end of September were 5 per cent less than those held on the first of the month and 6 per cent greater than quantities on hand as of Sept. 30, 1953.

Production — September, 1954

Compiled from Government Sources

Chemical	Unit	September 1954	September 1953	August 1954
Ammonia. synth. anhydrous	s. tons	208,408	195,484	222,430
Ammonia liquor, coal & coke (NH_3 content)	pounds	3,306,803	3,787,800	3,244,159
Ammonium nitrate, fert. grade (100% NH_4NO_3)	s. tons	129,915	107,001	140,743
Ammonium sulfate				
synthetic (technical)	s. tons	[1]92,201	47,831	96,206
Coke oven by-products	pounds	126,997,854	155,245,900	128,262,442
BHC (Hexachlorocyclohexane)	pounds	*2,609,094	———	3,430,204
Gamma content	pounds	*490,863	———	572,944
Calcium arsenate (commercial)	pounds	———	———	———
Copper sulfate (gross)	s. tons	5,928	———	4,756
DDT	pounds	*6,444,083	———	6,609,712
2,4-D Acid	pounds	———	———	1,253,152
esters & salts	pounds	*1,085,204	———	974,504
esters & salts (acid equiv.)	pounds	*759,072	———	734,055
Lead Arsenate (acid & basic)	s. tons	———	———	———
Phosphoric acid (50% H_3PO_4)	s. tons	[1]217,177	215,869	232,995
Sulfur, Native (Frasch)	l. tons	439,244	415,641	462,098
Recovered	l. tons	27,200	24,500	30,700
Sulfuric Acid, gross (100% H_2SO_4)	s. tons	1,120,743	1,111,649	1,096,573
Chamber process (100% H_2SO_4)	s. tons	200,670	199,415	180,269
Contact process (100% H_2SO_4)	s. tons	920,073	912,234	916,304
Superphosphate (100% APA)	s. tons	152,992	164,870	144,345
Normal (100% APA)	s. tons	117,131	126,886	104,121
Enriched (100% APA)	s. tons	2,455	———	3,607
Concentrated (100% APA)	s. tons	32,921	36,519	36,225
Wet Base (100% APA)	s. tons	485	392	1,465
2,4,5-T Acid	pounds	———	———	———

* Partly estimated. [1]Includes quantities for 1 plant previously not reporting.

FERTILIZER MATERIALS MARKET

New York

December 13, 1954

Ammonium Nitrate. Some movement was reported recently, but supplies are ample to cover buyers' expected requirements for the coming season.

Nitrate of Soda. Since the recent price reduction, the market was rather dull but a better demand is expected in another 30 days.

Urea. Demand for this material from the fertilizer trade has been poor recently, with very little foreign material arriving at the ports. Present prices are about $110 per ton, f.o.b. domestic production points.

Nitrogenous Tankage. Some recent sales were made of domestic material at $5 per unit of ammonia ($6.08 per unit N), f.o.b. production points. Offerings are scarce and most of the large producers are not offering or are in a sold up condition. Demand continues excellent.

Castor Pomace. Some limited sales were recently made of domestic material on the basis of $35 per ton, f.o.b. production points. A heavy demand is expected right through the current fertilizer season.

Organics. A steady demand was noted for organic fertilizer materials with some shortages cropping up from time to time. Blood sold at $7 per unit of ammonia ($8.51 per unit N), f.o.b. New York and tankage sold at $6.50 per unit of ammonia ($7.90 per unit N), f.o.b. eastern shipping points, with both feed and fertilizer buyers participating in the buying. Soybean meal was slightly easier in price as feed demand slackened, with last sales at $66 per ton, f.o.b. Decatur, Ill., in bulk. Linseed meal for December shipment was quoted at $67 per ton, f.o.b. Minneapolis in bulk. Cottonseed meal remained steady.

Fish Meal. The menhaden fishing season is over in the North, and buyers will have to depend more on imported fish meal. Some sales of 60 per cent fish meal reported as high as $150 per ton, f.o.b. shipping points, but demand at this price was said to be rather poor.

Bone Meal. This material continues in tight supply, and it is assumed there will be a definite shortage of fertilizer bone meal this Spring because of the limited production. Some imported feeding grade is being sold at around $71 per ton at the ports.

Hoof Meal. A steady demand is noted for this material and last sales were made on basis of $7 per unit of ammonia ($8.51 per unit N), f.o.b. Chicago but with few offerings.

Superphosphate. Producers have plenty of inventory at the present time, except for some export demand from time to time which helps keep their stocks down. Domestic deliveries have been rather poor, but a pickup is expected after January 1. Triple superphosphate is in good supply because of several new producers.

Potash. Shipments of domestic material continue against contracts, and although producers would like to see a better movement for this time of year, they feel shipments are satisfactory. Hearings will be held in another month or two in Washington regarding imported potash by the Treasury dept., which is investigating the situation pricewise.

Philadelphia

December 13, 1954

The materials market remains quiet. Orders from farmers are disappointingly slow, and it is feared that when they do come into the market it may be physically impossible to make complete delivery. Blood and tankage are fairly steady, while fish meal, castor pomace and nitrogenous tankage are higher and scarce. Bone meal is in somewhat scarce supply and price firm. The several forms of inorganic nitrogen are in slow demand and inventories are building up. There are ample supplies of both normal and triple superphosphate, and the potash movement is reported as seasonally average.

Sulfate of Ammonia. The demand is very quiet and quite a good portion of the production is being stored awaiting calls for Spring mixing.

Nitrate of Ammonia. The supply is more than ample and stocks are accumulating, which is somewhat unusual as compared with previous seasons.

Nitrate of Soda. Trade is seasonally dull with stocks quite sufficient to cover all current requirements. Better demand is expected when the Spring season gets under way.

Blood-Tankage-Bone. Blood and tankage are in rather easy supply. The former is quoted at $7 per unit ammonia ($8.51 per unit N), here in the East, and $7.25 ($8.82 per unit N), Chicago. Tankage is $6.25 ($7.59 per unit N), here and $7 to $7.25 ($8.51 to $8.82 per unit N), Chicago. Steamed bone meal is stronger at $68 to $72.50 per ton, depending on location, and supply is limited.

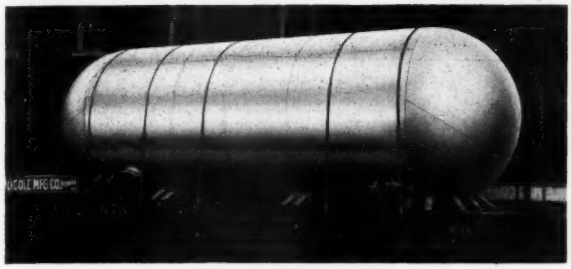
Castor Pomace. While still quoted at $30 per ton, this is definitely nominal, as nothing is obtainable. Imported has been quoted at $45 and up.

Fish Scrap. This is quite scarce and price has advanced, with menhaden meal at about $150 per ton and scrap $145. The production thus far in 1954 has been about even with 1953, but imports are greater.

Phosphate Rock. Contract withdrawals are reported as seasonally normal and fairly satisfactory.

Superphosphate. Supplies of both normal and triple are adequate to meet all present requirements and there is room for improvement in the demand.

Potash. Deliveries against contracts are said to be keeping up to normal for this time of the year, and stocks are being accumulated for the increased demand expected to develop in the coming month.



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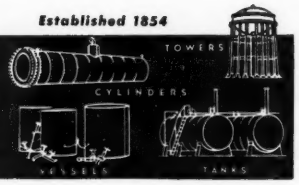

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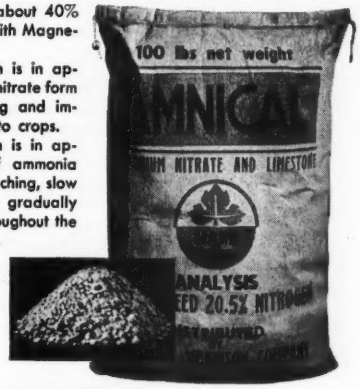

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editorial

The Fertilizer Industry

A RECENT survey by two members of the Arthur D. Little research staff shows a promising future for the fertilizer industry "barring a serious recession."

In their report entitled "The Fertilizer Industry," C. J. Matthew and S. E. Perkins traced development of NPK facilities, commenting that when current projects are completed competition will be more keen than in the past.

A constant search for more concentrated sources of plant food is indicated by the trend toward high-analysis fertilizers which, in turn, will require more complex technological developments and higher plant costs.

Profit margins, Matthew & Perkins claim, will probably be reduced to a level more comparable with that of the heavy chemical industry because of the increased competition, and this will be reflected by more research by fertilizer companies.

Improving Relations

"EFFECTIVE Employee and Community Relations" is the subject of a new Chamber of Commerce publication. Although it reviews the activities of a company well outside the farm chemicals industry, The Steel Improvement and Forge co., it does present many ideas that might prove of value to any organization.

Beset by labor troubles, poor employee relations and other ills, the company began in 1947 a program designed to build better relationships with the workers and their unions. Its effectiveness has been demonstrated by a lower level of labor disturbances, reduced Workmen's Compensation premiums (despite a steadily increasing payroll), a better informed supervisory force and better neighbor relations.

A management audit of the situation revealed that some executives were overloaded, resulting in poor attention to human problems and incomplete explanation of company policy. In addition, supervisors felt unsure of company policy, were not effective representatives of management and finally, too low a priority had been given to human relations.

Corrective action included initiation of a president-led employee communications program, organizational changes, switching reports of the personnel director from the superintendent to the president, attendance of executives at meetings and seminars of national business organizations and a comprehensive program of communications.

The latter phase included an employee newsletter, employee handbook, series of supervisory dinner meetings and an explanation cartoon book, "Let's Take a Look at Our Business."

The newsletter is written by the president, C. S. Smith, and is sent out by first class mail to the home of every employee monthly or every six weeks. A few months after this was initiated, a questionnaire found that over 90 per cent of the workers and over 35 per cent of their families regularly read the paper.

CRYSTALLIZATION and determination of many elements in the employee relations policy resulted through working on the handbook. Purpose was defined in two parts—to make clear what benefits and treatment employees could expect and to explain what the company expects of its workers.

The cartoon book followed a typical order step by step through the plant, showing where each job fit into the picture and designed to show the combined efforts necessary to turn an order into dollars. It has been distributed to employees, company friends and neighbors, open house visitors and institutions requesting the publication.

Dinner meetings for the management group stressed dissemination of information about operation of the company and emphasized discussion of long range policies.

Another step was a full-fledged open-house for employees, their families and company neighbors. The booklet describes preparation for the event and shows pictures of some of the displays which dramatized the company and its operation.

When business slackened in late 1949, management met the problem directly through a visual presentation delivered by the president to all employees, a program that showed the problem the company faced and the steps necessary to correct the situation.

In this column, we cannot go into detail concerning all of the activities that are included in the program of this forgings company. If their ideas interest you, we suggest that you write the Chamber in Washington for a copy of the publication.

It would seem that a management with foresight, one that takes the time to initiate and carry out an effective program in employee and neighbor relations, can do much to eliminate labor troubles, poor workmanship and other ills.

G. P. T., JR.
Editor

FREE INFORMATION to help you solve fertilizer, pesticide problems

Reader Service

Chemicals

1—IMC Triple Super

International Min. & Chem. corp. is now offering 46 per cent APA triple superphosphate. An improved process produces the right particle size and chemical structure for faster and more complete ammoniation with a texture that reduces pre-grinding problems. For samples and quotations

CIRCLE 1 ON SERVICE CARD

2—CSC Ammonia

Completion of an expansion program at Sterlington, La., has doubled the ammonia capacity of Commercial Solvents and the company can assure a dependable, year-round supply. The NH_3 is available in tank cars. A technical data sheet and 48 page ammonia bulletin is available.

CIRCLE 2 ON SERVICE CARD

3—Sterox AJ

Monsanto's Sterox AJ is a wetting agent that helps produce a better conditioned superphosphate with more efficient conversion and lower processing costs. Producers can use 60° Baumé acid, eliminating the conversion step. For more information

CIRCLE 3 ON SERVICE CARD

4—Fortier NH_3

Anhydrous ammonia is now available from the Fortier plant of American Cyanamid for both direct application and fertilizer formulation. For complete information on this new source of supply

CIRCLE 4 ON SERVICE CARD

5—Espersol Solvents

Espersol solvents from Eastern States Chem. have proven ideal for BHC, lindane, DDT, toxaphene, dieldrin and other toxicants and are not phytotoxic in the desired concentrations. The company claims high quality and exceptional uniformity with adequate inventories, insuring short notice delivery. Catalogs and specifications are available.

CIRCLE 5 ON SERVICE CARD

6—Stabilized Heptachlor

Handling properties of the new stabilized heptachlor in fertilizer mixtures will enable formulators to cash in on corn rootworm control, says the Velsicol corp. Advantages include assured stability, no handling problems or offensive odors, proved uniform effectiveness and immediate delivery of all concentrate formulations. For information

CIRCLE 6 ON SERVICE CARD

7—HLB Calculations

How do you figure HLB numbers? Atlas Powder has a pamphlet useful to all who use surfactants which shows how you figure the HLB number, the Atlas system for determining which surface active agent to use for a particular material.

CIRCLE 7 ON SERVICE CARD

8—Cooper Emulsifiers

Wm. Cooper & Nephews offers a complete line of pesticide emulsifiers to fit every need. They perform with either aliphatic or aromatic solvents, are effective in hard and soft water and assure shelf life and field performance. For samples, specifications and formulation sheets

CIRCLE 8 ON SERVICE CARD

9—Granular Clays

Attapulgus clay is available in granular grades for formulation of soil pesticides. If interested in these grades, you can obtain samples and a data sheet.

CIRCLE 9 ON SERVICE CARD

10—Agrimuls

A booklet on the new series of Agrimul pesticide emulsifiers has been issued by Nopco Chemical. For a copy

CIRCLE 10 ON SERVICE CARD

How to use the
READER SERVICE CARD

- **Circle number of literature you want.**
- **Print or type your name, position, company and address.**
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Materials Handling

11—Michigan Tractor Shovel

Clark Equipment's Michigan tractor shovel features a "bonus in every bucket," more than two yards capacity in the one yard capacity bucket without sacrifice of stability or traction. Two double acting cylinders provide tremendous breaking out power, enabling the operator to work the bucket while it is buried deep in a pile. For specifications and a lease plan data sheet

CIRCLE 11 ON SERVICE CARD

12—Sauerman Scraper

Design of scrapers from Sauerman Bros. permits location of highly machined parts outside the building away from corrosion and dust—only the crescent scraper and cables contact the material. They can be designed to operate on the top of non caving material allowing the scraper to break down any high faces. Units are built for hourly capacities of from 20 to 600 cubic yards. For a catalog on bulk storage and field reports

CIRCLE 12 ON SERVICE CARD

13—Car Spotting

A catalog from Link-Belt reviews the company's electric car spotters which permit one man to spot six loaded railroad cars at a time or to handle other horizontal haulage jobs. Included is engineering information, calculation instructions and typical layouts for both car spotters and car pullers.

CIRCLE 13 ON SERVICE CARD

14—Bulkmobile Body

Designed for big jobs, the Bulkmobile Transport Body will save up to 75 per cent on handling time alone, says Baughman Mfg. A new bulletin describes construction features including all-hydraulic operation of the body conveyor, discharge accessories, compartmented interior, externally controlled compartmented doors and other data.

CIRCLE 14 ON SERVICE CARD

15—Towmotor Plans

Towmotor corp. now offers a leasing or time payment plan for those purchasing its fork trucks and tractors. The units can be purchased on lease with small monthly rental payment or with minimum down and monthly payments. For a descriptive folder

CIRCLE 15 ON SERVICE CARD

16—Box Car Unloader

A new box car unloader bulletin has been issued by Stephens Adamson Mfg. Use of the unit is limited to relatively free flowing materials and provides an economical solution for requirements exceeding the output of hand operated power shovels but not requiring large rotary dump installations. For a copy

CIRCLE 16 ON SERVICE CARD

17—Lease Plan

Lewis-Shepard Products has announced a 6-Way Procurement Plan which makes it possible for industrial truck purchasers to utilize lease, time-payment, rental, outright purchase, truck trial or trade-in methods. For a brochure describing the plan in detail

CIRCLE 17 ON SERVICE CARD

18—Baker-Lull

Full information is available on the Baker Lull model 20, 12 cu. ft. Shoveloader selling for $3395. Lift height is 7 feet with a lifting capacity of 1,500 lbs. Loader arms are located in front of the operator for safety and visibility and a variety of attachments is available. A bulletin is available.

CIRCLE 18 ON SERVICE CARD

19—Preventive Maintenance

A reprint has been issued by Elwell-Parker Electric on preventive maintenance for industrial trucks, covering the importance of correct lubrication, principal causes of breakdown, record-keeping and other related subjects.

CIRCLE 19 ON SERVICE CARD

20—Yale Trucks

Yale & Towne gasoline, diesel and LPG industrial lift trucks in capacities from 1,000 to 10,000 lbs. are described in a new 12 page bulletin. Included is a chart providing a check sheet of specifications, and Yale features are shown in cut-away photographs.

CIRCLE 20 ON SERVICE CARD

21—Magcoa Hand Trucks

The new line of Magcoa magnesium hand trucks features lightness, all-bolted construction and a choice of models and accessories. A bulletin shows design, features and applications of the recently-redesigned units.

CIRCLE 21 ON SERVICE CARD

Process Equipt.

22—Uni-Blenders

Technical bulletins are available on Poulsen Uni-Blenders, compounding plants for pesticide formulation. These are complete, ready to run units, designed for maximum hourly production of quality products at minimum costs. The dual type plant elevates, mixes, pulverizes and packages dust concentrates and field strength dusts including those involving liquid impregnation. Stock models have mixer capacities of from 40 to 100 cu. ft.

CIRCLE 22 ON SERVICE CARD

23—Hardinge Feeder

During the past year the Hardinge constant-weight feeder has been accepted by a number of fertilizer manufacturers, says the producer. The feeder provides accurate blending, requires only low head room and in most cases handles material delivered by a belt conveyor. For a catalog sheet

CIRCLE 23 ON SERVICE CARD

24—Mix-Mullers

The Simpson Mix-Muller is the subject of a new bulletin answering questions about mulling and describing applications in preparing dry, wetted and plastic mixtures. Detailed specifications are included on 13 models in the new Simpson series. Another feature is a conversion table for interpolating measurement of various substances into cubic feet as an aid in determining capacity requirements.

CIRCLE 24 ON SERVICE CARD

25—Control Valve

Complete details of a new type of control valve for handling solids in suspension, acids or other bulk materials in pipe lines are contained in a brochure from the Red Jacket co. The valve can be operated manually or hydraulically.

CIRCLE 25 ON SERVICE CARD

Packaging

26—Lamo-Pack Bags

According to Arkell & Smiths, tests prove that the A&S Lamo-Pack bag is twice as effective a moisture barrier as usual kraft sacks. The bags cost 10 per cent less than double asphalt lined kraft, have less paper stiffness and permit an easier closure operation. For additional information

CIRCLE 26 ON SERVICE CARD

Miscellaneous

27—Doane Services

A booklet is available from Doane Agricultural Service describing its services offered in research on products sold to or bought from farmers, potential sales, market trends, new products and other problems in selling to the farmer.

CIRCLE 27 ON SERVICE CARD

28—Flo-Mix Unit

The Flo-Mix applicators distributed by Plantation Fertilizers permit ammonia applicators to apply any desired NPK ratio. They are sold complete, ready to receive a 500 gallon tank on the full floating trailer. For prices

CIRCLE 28 ON SERVICE CARD

29—Productive Maintenance

General Electric describes five steps to productive maintenance in a new manual. The increasing steps toward automation, points out GE, make it essential that you consider the demands the trend will make on your electrical maintenance program. The publication shows how to get more maintenance out of every dollar in your budget.

CIRCLE 29 ON SERVICE CARD

30—Buehler Tanks

Storage, service and trailer or mobile applicator tanks for handling NH_3 are offered by Buehler Tank & Welding Works. Sizes range from 500 to 1,000 gallon capacities and the trailer tanks are available in two and four wheel models. For a descriptive catalog

CIRCLE 30 ON SERVICE CARD

31—Kaiser Plants

The work done by Kaiser Engineers in the chemical field is outlined in a recent brochure. Included are short case histories of some of the projects in which the organization has engaged.

CIRCLE 31 ON SERVICE CARD

32—S&L Catalog

A complete S&L catalog includes data on five new additions to the company's line of fittings for the anhydrous ammonia industry. All are ruggedly constructed of steel to deliver maximum capacities under all load conditions.

CIRCLE 32 ON SERVICE CARD

33—Air-Grip Clutch

Features of the new Dodge Mfg. Air-Grip Clutch are reviewed in a four page bulletin. In addition to information on air control and release valves, there are data on clutch sizes, dimensions, bore sizes, weights and list prices.

CIRCLE 33 ON SERVICE CARD

See the Industry News section, pages 20-21 for information on these Reader Service numbers—

34—Shattuck Molybdate
35—TL-6 Tracto-Loader
36—Rotocycle Meters
37—Saco Bag Conveyor
38—Baughman Bulkmobile
39—Sweco Separators
40—HFC Payloader
41—Sargent Dryer
42—pH Determination
43—Penco Steel Ramps
44—Magline Conveyor
45—Neoprene Lining

Buyers' Guide

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Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Shell Chemical Co., Agr. Chem. Div., Denver, Colo.

AMMONIA—Anhydrous and Liquor
Commercial Solvents Corporation, New York City
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
U. S. Industrial Chemicals, New York City

AMMONIA APPLICATORS
KBH Corp., Clarksdale, Miss.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Commercial Solvents Corporation, New York City
Lion Oil Co., El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE
See Sulfate of Ammonia

BAGS—Multiwall-Paper
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Kraft Bag Corporation, New York City
Union Bag & Paper Corp., New York City

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
International Paper Co., Bagpak Div., N. Y. C.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Pennsylvannja Salt Mfg. Co., of Wash., Tacoma, Wash.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
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CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.

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National Lime & Stone Co., Findlay, Ohio

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Link-Belt Co., Chicago, Ill

COPPER SULFATE
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
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Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa

CUSTOM PESTICIDE FORMULATION
Barco Chemicals, Inc., Des Moines, Ia.

DDT
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Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

DIELDRIN
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Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

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Pioneer Pyrophyllite Producers, Beverly Hills, Calif.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.
Thomas Alabama Kaolin Co., Baltimore, Md

DITHIOCARBAMATES
Berkshire Chemicals, New York City

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Marietta Concrete Corporation, Marietta, Ohio
Stedman Foundry and Machine Co., Aurora, Ind.

FERTILIZER—Liquid
Clover Chemical Co., Pittsburgh, Pa.

FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
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Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.

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Jackle, Frank R., New York City
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Lion Oil Company, El Dorado, Ark.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.

HERBICIDES—Oils
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Stedman Foundry and Machine Co., Aurora, Ind.

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Fairfield Chem. Div., Food Mach. & Chem. Corp., New York City
Pennsylvanna Salt Mfg. Co., of Wash, Tacoma, Wash.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div. Pittsburgh, Pa.
Shell Chem. Corp., Agr. Chem. Div., Denver, Colo.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

KAOLIN
Thomas Alabama Kaolin Co., Baltimore Md.

LEAD ARSENATE
American Agricultural Chemical Co., N. Y. C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
National Lime & Stone Co., Findlay, Ohio

MACHINERY—Acid Making and Handling
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Acidulating
Chemical Construction Corp., New York City

MACHINERY—Grinding and Pulverizing
Bradley Pulverizer Co., Allentown, Pa.
Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.

Buyers' Guide

MACHINERY—Material Handling

Clark Equipt. Co., Construction Mach. Div., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.
Link-Belt Co., Chicago, Ill.
Poulsen Co., Los Angeles. Calif.
Power-Curve Conveyor Co., Denver, Colo.
Sauerman Bros. Inc., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging

Poulsen Co., Los Angeles, Calif.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Power Transmission

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY

Superphosphate Manufacturing

Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

MAGNESIUM SULFATE

Berkshire Chemicals, New York City

MANGANESE SULFATE

Tennessee Corp., Atlanta, Ga.

MANURE SALTS

Potash Co. of America, Washington, D. C.

MINOR ELEMENTS

Tennessee Corporation, Atlanta, Ga.

MIXERS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF POTASH

Berkshire Chemicals, New York City

NITRATE OF SODA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS

Commercial Solvents Corporation, New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.

NITROGEN MATERIALS—Organic

American Agricultual Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray

Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

PHOSPHATE ROCK

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID

American Agricultural Chemical Co., N. Y. C.

PLANT CONSTRUCTION—Fertilizer and Acid

Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Link-Belt Co., Chicago, Ill.
Stedman Foundry and Machine Co., Aurora, Ind.

POTASH—Muriate

American Potash & Chemical Corp., N. Y. C.
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Bradley & Baker, N. Y. C.
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.
Southwest Potash Corporation, New York City
United States Potash Co., N. Y. C.

POTASH—Sulfate

American Potash & Chemical Corp., N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Potash Co. of America, Washington, D. C.

PRINTING PRESSES—Bag

Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pioneer Pyrophyllite Producers, Beverly Hills, Calif.

REPAIR PARTS AND CASTINGS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCALES—Including Automatic Baggers

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SCRAPER MACHINES

Sauerman Bros., Inc., Chicago, Ill.

SCREENS

Atlanta Utility Works, The, East Point, Ga.
Stedman Foundry and Machine Co., Aurora, Ind.

SHOVEL LOADERS

Clark Equipt. Co., Benton Harbor, Mich.
Hough, The Frank G. Co., Libertyville, Ill.
Jaeger Machine Co., Columbus, O.

SPRAYS

Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

STORAGE BUILDINGS

Butler Manufacturing Co., Kansas City, Mo.
Marietta Concrete Corporation, Marietta, Ohio

STORAGE TANKS

Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D., Manufacturing Co., Newnan, Ga.

SULFATE OF AMMONIA

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA

International Min. & Chem. Corp., Chicago, Ill.

SULFUR

Ashcraft-Wilkinson Co., Atlanta, Ga.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying

Ashcraft-Wilkinson Co., Atlanta, Ga.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.

SUPERPHOSPHATE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
Davison Chemical Co., div. of W. R. Grace & Co., Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated

Armour Fertilizer Works, Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC

Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE

American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Bradley & Baker, N. Y. C.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Smith-Rowland Co., Norfolk, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TANKS—NH3 and Liquid N

Broadway Rubber Corp., Louisville, Ky.
Butler Manufacturing Co., Kansas City, Mo.
Cole, R. D. Manufacturing Co., Newnan, Ga.
KBH Corporation, Clarksdale, Miss.

TOXAPHENE

Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Coke & Chem. Co., Agr., Chem. Div., Pittsburgh, Pa.

2, 4-D

Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem Div., Pittsburgh, Pa.

2, 4, 5-T

Diamond Alkali Co., Newark, N. J.
Pittsburgh Coke & Chem. Co., Agr. Chem. Div., Pittsburgh, Pa.

UREA & UREA PRODUCTS

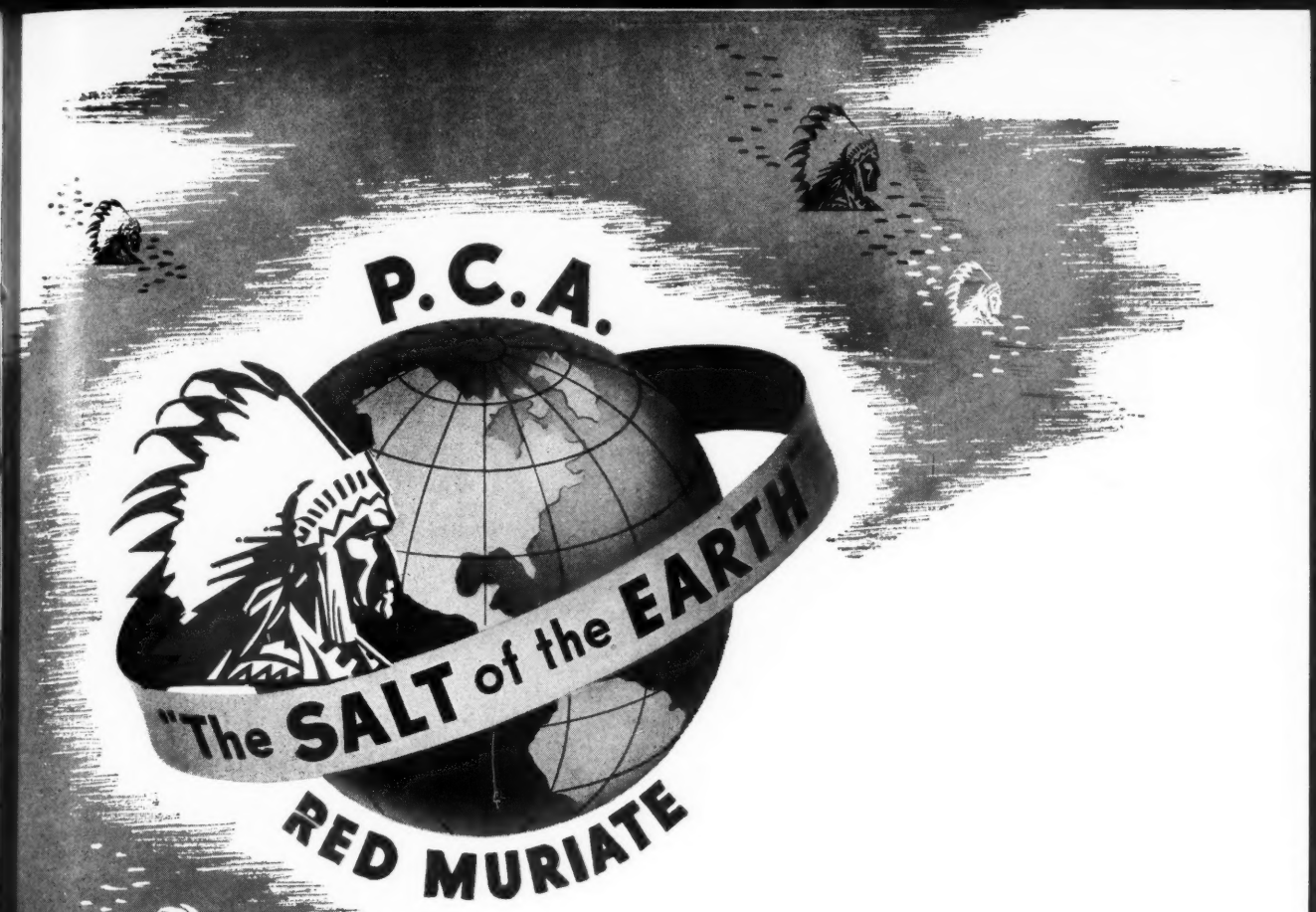
Bradley & Baker, N. Y. C.
Grand River Chem. Div., Deere & Co., Tulsa, Okla.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C

VALVES

Monarch Mfg. Works, Inc., Philadelphia, Pa.

ZINC SULFATE

Tennessee Corp., Atlanta, Ga.



A Thought for the New Year

A thought for consideration as we enter the new year.—

Confidence is similar to a pebble in a lake—it forms ever widening circles.

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